The Builder.

No. CLXII.

SATURDAY, MARCH 14, 1846.

THE connection of architecture, sculpture, and painting, and their value to each other; the elevation of the general standard of taste, by rendering the finest productions of art familiar to the eyes of all; the union of decorative and historical art; the importance of inducing artists to discard the notion that the application of their skill to decorative purposes would be derogatory; and the dearth of a middle-class of artists willing to work under, and carry out efficiently, the designs of others,—are all strongly felt by us, and have been urged on various occasions, to the extent of our power.

Architecture has too long stood aloof from her sister-arts, proudly self-sufficient, and, notwithstanding numerous examples of the admirable, and not to be otherwise obtained, effect of harmoniously working in concert with them, first affected a contempt for their aid, and came at last to feel it: so much so, indeed, that many persons are still found who object *in toto* to the polychromatic decoration of architectural structures. These, however, are many fewer than they were five years ago: in all our recent buildings, the importance of the combination is admitted, and Mr. Barry's *opus magnum* will display it carried to a high extent. We foresee a considerable and increasing demand for artistical decoration,—architects are now strongly disposed to avail themselves of it wherever it is practicable, and we sincerely hope that no difficulty will be found in obtaining from amongst their countrymen the aid they seek.

The exercise of high art on a mean material does not lower the art, but exalts the material. The hand of a man of genius can dignify a pebble, and make a plaster ceiling a shrine for pilgrims.

The greatest artists the world ever saw, have not refused to employ themselves in what is called decoration, but is something more, because they have made it so. Cimabue, Giotto, and their scholars, in the 13th and 14th centuries; Perugino, in the 15th; Raffaelle, (called without impiety, by those who can best appreciate him, the *divine*,) and Giulio Romano, in the 16th, and the universally-gifted Michael Angelo, in the 17th, have left in the churches and palaces of Florence, on the vaults and walls of the Vatican, the Villa Madama, and elsewhere, striking proofs at once of their genius, and of the necessity of having one head and many hands for works of this description. As it took many poets to make Homer, so were many painters needed to produce Raffaelle: tributary streams to form a noble river, but which nevertheless maintained in many cases their individuality, and having played their part in effecting works of universal benefit, emerged the stronger for the aid they had given, and pursued their own course to fame.

The considerations thus briefly stated, and one other, lead us to regard with considerable interest the decoration of Her Majesty's Theatre, which has been effected in the incredibly short space of ten weeks (including stripping the old house, and recanvassing preparatory for the paintings), and is unquestionably a highly successful work,—in fact, we are disposed to say, the most successful work of its kind yet achieved in London.

Many persons have necessarily been employed upon it; and to all great praise is due. The Raffaelesques were chiefly directed by Mr. Sang and his German corps. Mr. Marshall, the artist attached to the theatre, assisted by Mr. Wright, has ably executed the most important subjects, including the ceiling. The figures in the medallions and in the panels, of the first tier, were executed by Mr. Powel and his assistants, Mr. Desurne, Mr. Fox, Mr. Roho, Mr. Shaw, and Mr. Earl, all students of the Royal Academy. To all these gentlemen, as we have already said, and to others employed, great praise is due; but it is left for us to state, that the merit of the work as a whole, of course the chief merit, is due to Mr. John Johnson, Architect, of the Adelphi, who went into Italy some short time ago as travelling student of the Royal Academy. Mr. Johnson's name has hardly been mentioned in connection with the work (not unusual with architects), and we consider it our duty on that account, to bring it forward more prominently than we might otherwise have done, and to claim for him the credit of the undertaking as a whole, with due acknowledgment of the great praise to which Mr. Lumley is entitled for his taste and liberality. Some time since, Mr. Johnson designed the decorations of the Earl of Pembroke's mansion in Carlton-gardens, and this led to his introduction to the manager, who employed him in the work under consideration, without any limitation or control.

Considering that other styles of decoration had become hackneyed, he resolved to adopt the style used by Raffaelle and his pupils, which he had studied carefully in Italy; and he has carried out his intention most successfully. The chief merit of the design,—its one-ness, its accordance and continuity,—is the result of one mind having controlled the whole.

We shall not attempt very minute description of the ornaments. The front of each tier of boxes is varied, both in design and character. The lower tier has medallions from Raffaelle, Giulio Romano, and Pompeii, in centre of lozenge-shaped panels, containing figures on a chocolate-coloured ground. The next tier has also figures, on metal back-ground. The succeeding tiers are more purely decorative, and the embellishments, as they approach the roof, become progressively lighter. The ceiling, taken in part from the Villa Madama, connects historical and decorative art, and contains Albano's "Four Elements," with copies of other celebrated works; and over the proscenium is the "Aurora" of Guido charmingly enwreathed.

The tone is perfect. Notwithstanding the infinite variety, the life and movement of all the parts, the effect of the whole is subdued and unobtrusive, and the eye wanders from point to point, pleased and never tired, to rest ultimately on the stage, which is decorated with a drop scene executed by Stanfield, with the aid of Mr. Telbin and Mr. John Absolon. The scene is architectural, of the same character as the decorations of the house, and by its arrangement gives the effect of great space to the stage.

When looking towards the house from the stalls or pit, a charming effect is observable in the gallery; the ceiling is coloured blue, and as seen beyond a broad band of Raffaelesques, the termination of the ceiling of the vaulted house, gives the notion of a brilliant nigh in a more balmy land.

M. Hittorff, in a report on a collection of decorations taken from the antique and the works of the Renaissance, printed in the "Annales de la Société libre des Beaux Arts," says (when urging the practice of this mode of decoration), it is especially necessary to master the principles established by the ancients, and to adhere to them in avoiding, amidst variety and abundance, that confusion which fatigues the eye and troubles the mind. It is important to obtain above all a unity of thought, a harmonious relation between all the parts; a symmetry, if not rigorous, at least apparent in the principal subjects; it is necessary that men of talent commissioned to execute such works should remember, that the greatest and most sincere admirers of the painter of the Loggie of the Vatican, all admit, that he there passed the limits wisely placed by the ancients; that blinded by too great confidence in the power of his genius, led into it also, perhaps, by the dazzling facility of execution possessed by his able pupils, he remained behind his masters; in short, that Raffaelle did not possess, like them, the great art of being magnificent with moderation, rich with simplicity, and of attaining, with the employment of the most varied creations, that most important of all qualities—*unity*.

We cannot more highly compliment the parties concerned in the decoration of her Majesty's Theatre than by saying, in conclusion, that they have all borne in mind the importance of this great quality, and have achieved remarkable success.

The public have good reason to be dissatisfied with the eagerness exhibited by the Government to pass the new Metropolitan Buildings Bill into a law. No good can possibly result from such unwise haste, and evils which might be anticipated and avoided, will most probably be produced. On Saturday last, the bill was first published, on Wednesday last it was read a third time and passed the House of Commons without the slightest discussion. A copy of it *in extenso* will be found in our present number, but we fear we shall fail in our object, which was to call the attention of the public to its several features, and to elicit suggestions. We are foiled in this, at all events so far as the House of Commons is concerned. Let us hope that the Upper House will give the measure a more calm consideration, and allow of its points being discussed out of doors before it pass into a law.

We shall give it consideration next week. The intention of one of the clauses seems quite incomprehensible. It is greatly to be feared, that passing the Bill in question will have the serious effect of postponing the much called for revision of the existing Act.

ROYAL INSTITUTE OF ARCHITECTS.—An ordinary meeting of the Institute was held on Monday evening last, Mr. Papworth in the chair. Mr. Donaldson exhibited specimens of a fine work on the fresco paintings of Pompeii and Herculaneum, by Mr. Ternite, with a text by Professor Welker. The honorary secretary read part of the prize-essay on brick, by Mr. Worthington, which gives a history of this material, beginning, as in duty bound, before the building of Babel, and ending one day last week. We will speak of the merits of the paper when the remainder has been read.

LIVERPOOL TOWN-HALL.—The grand staircase is to be decorated by Mr. Ingram, of Birmingham, at a cost of nearly 1,000*l*.

ON THE CURVED LINES OF THE PARTHENON.

THEORY OF ENTASIS.

BY F. C. PENROSE, ARCHITECT.

It is only recently that it has been observed that the line of the steps of the Parthenon and Temple of Theseus, at Athens, are not horizontal, but curve upwards in a vertical plane. Mr. John Pennythorne was the first, I believe, to observe this, but he unfortunately did not immediately publish it. It first appeared in a Vienna journal, I think in the year 1841.

I will begin at once to describe some observations which I made on this subject during a stay of three months at Athens last year. I will confine myself to the eastern front of the Parthenon.

I shall adopt the notation of the English foot decimally divided, which it is to be hoped may soon become universal.

On proceeding to level from the highest point of the S.E. angle of upper step, I obtained the following ordinates, taken at the centre of each column.

Centre of S.E. angle.	Horizontal distance between the measured points.	Height above or below level line.
Column No.	0 — — — —	—0
1	3·34 ft. from angle	·03 ft. above
2	12·125 ft. from No. 1	·09
3	14·088 ..	·148
4	14·092 ..	·21
5	14·108 ..	·222
6	14·083 ..	·19
7	14·108 ..	·10
8	12·025 ..	·018 below
N.E. angle	101·29 .. from S.E. angle	·028 below

It will thus be seen that the N.E. angle has slightly settled. And also there are evident signs of other small settlements, so that these dimensions are not sufficient, without most minute measurement of every separate stone and crack, to determine the exact nature of the curve which the step originally had; but I am inclined to suppose that the following was very nearly the truth, viz., that the stylobate or step at the centre intercolumniation was level, and then descended at a gradient of about one in 250 to the last column but one, whence it had a fall of about 1 in 150 to the angles. The latter addition was probably to throw off rain water better, as it does not appear in the architrave, which otherwise follows exactly the line of the steps (except so far as the architrave being composed of only seven stones, has not suffered so much displacement as the stylobate, which consists of twenty-four stones). The angular columns are ·02 feet longer than the others, to compensate for this difference between the step and architrave at the angles of the building.

The columns lean inwards towards the cella, about ·225, both in the fronts and the flanks. The capitals on the contrary, have their axes leaning as much outwards as the shafts of the columns lean inwards. This construction necessarily arises from the curvature given to the stylobate and architrave, as any one may see at once by sketching the column exaggerating these differences. Of course, the angular column leans inwards at an angle of 45°, the rest are simply inclined backwards at angles to the fronts and flanks. In the columns, all the stones except the upper and lower of each are angular to the axis of the columns. These (the upper and lower courses) are the "Scamilli impares" of Vitruvius, whose obscure passage is now rendered quite clear, by the discovery of these wonderful refinements of the Greeks. They were, of course, intended to correct the false impression which the eye receives in contemplating a portico, whose lines are exactly horizontal. Vitruvius says, that in such case, the step appears to sink in the middle; but I think the method originated rather from the contemplation of the entablature than the step, as the raking lines of the pediment would have the effect by contrast, of apparently deflecting a horizontal corona, in the same way as a chord or tangent of a circle always appears bowed in a direction contrary to the curvature.

Another curious optical adjustment I observed on the south side of the building, which is, no doubt, owing to its position, immediately over-hanging the precipitous rock. Every abacus in that side is ·17 feet, or nearly two-tenths of a foot less in breadth, than those on the north side, east and western fronts. The angular abaci, again, are about ·1 foot larger than the latter.

These (the angular ones) are exactly one-fifth the height of the column. The others are exactly one-fifteenth of the upper step of the fronts, which is, in all probability, 100 Olympic feet. Those on the south side are 6¼ such feet, or ·065 × upper step.

The angular abacus is 6·849 English feet.
" ordinary ditto 6·753 "
" south side ditto 6·584 "

That in the British Museum is of the latter class. If the abacus (*i.e.* either of the two first) be divided into thirty parts, twenty-eight such parts will give the lower, and twenty-two the upper diameter of the column. I have found the entasis of the column to be produced by its being an hyperboloid of revolution; the principal axis of whose generating hyperbola is = 1·013 English feet (*i.e.* one hundredth part of upper step), or one Greek foot; and the distance between the foci = 60 such feet; or in mathematical language—

$$a = 1{\cdot}013 \text{ feet } ae = 30$$

$$\therefore \frac{b^2}{a^2} = 899$$

The axis or line of foci, is twice the breadth of the smaller abacus, or 13·12 feet below the upper step.

I had great satisfaction in being able to verify my own dimensions with some with which Mr. Scoles kindly favoured me. I obtained first from him only the vertical dimensions, then, on comparison, we found that the horizontal dimensions, which I obtained from the hyperbolic theory, by calculation, in nine cases out of eleven, coincided most closely with his, though the measurements which I had taken were from a different column, and taken in a different manner from his.

A BILL

TO AMEND AN ACT FOR REGULATING THE CONSTRUCTION AND USE OF BUILDINGS IN THE METROPOLIS AND ITS NEIGHBOURHOOD.

Preamble: 7 & 8 *Vict., c.* 84.—Whereas an Act was passed in the session of Parliament holden in the seventh and eighth years of the reign of her present Majesty, intituled, "An Act for regulating the Construction and the Use of Buildings in the Metropolis and its Neighbourhood," whereby, amongst other provisions, one of her Majesty's principal Secretaries of State was empowered to appoint two persons, being of the profession of an architect or surveyor, to be official referees of metropolitan buildings for the purposes of the said Act, and from time to time, as he should think proper, to remove such official referees, and in their place to appoint other persons so qualified; and the Commissioners of her Majesty's Woods, Forests, Land Revenues, Works and Buildings were authorized to appoint a registrar of metropolitan buildings, who should hold his office during the pleasure of the said commissioners; and it was enacted, that the determination of such two official referees, or of one of them with the assent of the said registrar, as to all or any matters referred to them, should be binding on all parties to such reference; and that any matter required or permitted to be done by the official referees might be done by either of them with the assent of the said registrar, unless express provision to the contrary should be made, and if done by any one of them, with such assent, should be as valid and effectual as if done by both of them; and by the said Act the said official referees were prohibited from acting as surveyors, and every person being or becoming commissioner, receiver, steward, or agent of any owner of houses within the limits of the Act, was disqualified from holding the office either of official referee or of registrar under the said Act.

And whereas the duties and qualifications for office of the registrar of metropolitan buildings are of a character wholly distinct from the duties and qualifications for office of the official referees, and it would conduce to the more satisfactory execution of the recited Act if there were three official referees (all of them being of the profession of a surveyor or architect), and the acts and awards of such three official referees, or of any two of them, were made as valid and binding as if the same had been done or made under the authority of the recited Act by the two official referees thereby authorized to be appointed, or by one of them with the assent of the said registrar; and for the purpose of obtaining persons duly qualified to discharge the functions of official referees without increase of charge to the public or the localities comprised within the limits of the recited Act, it is expedient to relax in manner hereinafter mentioned the prohibitions and disqualifications appertaining to the office of official referees under the said recited Act.

1. *Appointment of an additional Referee.*—Be it therefore enacted, by the Queen's most excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons, in this present Parliament assembled, and by the authority of the same, that it shall be lawful for one of her Majesty's principal Secretaries of State, and he is hereby empowered at any time after the *passing of this Act*, and from time to time, to appoint a person, being of the profession of an architect or surveyor, to be an official referee of metropolitan buildings, in addition to the official referees authorized to be appointed by the recited Act, and from time to time, as he shall think proper, to remove such additional official referee, and to appoint any other person qualified as aforesaid in his place; and every official referee to be appointed under the authority of this Act shall make the same declaration of official fidelity, and have the same duties, powers, authority, and jurisdiction, and be subject to the same rules and regulations (save as hereinafter varied or relaxed) as if the said recited Act had authorized the appointment of three official referees, and the official referee appointed under the authority of this Act had been appointed official referee under the authority of the recited Act.

2. *Two Official Referees may act.*—And be it enacted, that all acts, matters and things by the said recited Act required, directed or permitted to be done by the official referees of metropolitan buildings, or by one of such official referees, with the assent of the registrar, may be done by the official referees appointed and to be appointed under the authority of the recited Act and of this Act, or by any two of them; and that the acts, certificates, awards, orders, and determinations of any two of the said official referees shall be as valid, binding and effectual as if the same had been done, signed, made, or determined by all the said official referees; and the assent of the said registrar of metropolitan buildings shall not be required to give effect to the same; and the assent of the said registrar shall not render valid any act, certificate, award, order or determination, done, signed or made by one only of the said official referees, which would not be valid without such assent.

3. *Official Referees may act as Surveyors with permission of Secretary of State, and disqualifications may be relaxed: Special Referees to be appointed in certain cases.*—And be it enacted, that notwithstanding any thing in the said recited Act to the contrary contained, it shall be lawful for one of her Majesty's principal Secretaries of State, if and so long only as he shall think proper, by any writing under his hand, to permit and authorize any one or more of the persons who for the time being may hold the office of official referee to act as surveyor, either alone or with any partner, or by an agent; and no person shall be ineligible or disqualified from holding the office of official referee by reason of his continuing to act as a surveyor with such permission as aforesaid, or by reason of his being or becoming commissioner, receiver, steward, or agent, for or on behalf of any owner of houses or land within the limits of the said recited Act, provided the fact of such person being or becoming such commissioner, receiver, steward, or agent be notified to one of her Majesty's principal Secretaries of State, and licensed by him in writing, before such person be appointed or continue to act as official referee; but it shall not be lawful for any person holding the said office to act as official referee in the case of any building or matter in which he shall be

employed as architect or surveyor, or where he shall be the commissioner, receiver, steward, or agent of any person interested in such building or matter; and if it shall happen that more than one of the said official referees shall be employed as architect or surveyor as to the same building or matter, or shall be the commissioner, receiver, steward, or agent of any person interested therein, or if any disagreement or difference of opinion shall arise between any two official referees who shall act as to such building or matter, not being employed as architect or surveyor, or as commissioner, receiver, steward, or agent of any person interested therein, it shall be lawful for the Commissioners of her Majesty's Woods, Forests, Land Revenues, Works and Buildings, from time to time, upon the report of the official referees or any one of them, or upon the application of any person interested in the matter in dispute, to authorize one or more competent persons, being of the profession of an architect or surveyor, to be special referees in respect of such particular building or matter either in conjunction with the acting official referee or referees, or alone, as the case may require; and every special referee authorised by the said commissioners shall, as to the particular building or matter for which he is authorized, have the same power, authority, and duties, as if he had been appointed an official referee under the authority and for the general purposes of the said recited Act; and it shall be lawful for the said commissioners to assign to every such special referee such part of the remuneration of the official referee or referees who shall be disqualified as aforesaid from acting as to such particular building or matter, or otherwise to remunerate him as the said commissioners shall think fit.

4. *Offices vacant.*—And be it enacted, that if any official referee shall act as surveyor, either alone or with any partner, or by an agent, or as commissioner, receiver, steward, or agent, for or on behalf of any owner of houses or land within the limits of the said recited Act, without the license and consent in writing of one of her Majesty's principal Secretaries of State, or shall continue to act as surveyor, either alone or with any partner, or by an agent, or to act as such commissioner, receiver, steward, or agent as aforesaid, after such license and consent shall have been withdrawn or shall have expired, then he shall cease to be qualified to hold the office of official referee, and thereupon such office shall be vacant, without prejudice nevertheless to any acts done by him in his capacity of official referee, so far as other persons are affected thereby.

5. *Salaries of Official Referees.*—And be it enacted, that it shall be lawful for her Majesty from time to time to grant such salaries for the remuneration of the said official referees respectively as her Majesty shall, as to each of them, be pleased to appoint, not exceeding in the whole for the three referees the sum of *two thousand* pounds per annum.

6. *Contributions to be paid to the Consolidated Fund and Salaries paid thereout.*—And whereas for the purpose of providing for the payment of a portion of the salaries of the official referees and registrar under the said recited Act, it was by the said Act enacted, that the lord mayor and aldermen of the city of London should direct the chamberlain of the said city, and the justices of the peace for the several counties of Middlesex, Surrey, and Kent should direct the treasurer of such respective counties to pay by two half-yearly payments in the months of June and December in every year to or into the hands of the cashier of the Commissioners of Works and Buildings on account of the said official referees, and of the said registrar, the several sums of money therein mentioned as and by way of contribution to such salaries; and it was enacted, that the balance of such salaries should be payable and paid out of the Consolidated Fund of the United Kingdom: and whereas such salaries are by the said Act directed to be paid quarterly, and the contributions towards payment of the same being payable half-yearly, it has not been practicable to pay such salaries as directed by the said Act, and it has been found inconvenient to pay the same in part out of monies contributed by the said city and counties respectively and in part out of the Consolidated Fund of the United Kingdom; BE it therefore enacted, That the several sums of money which under the said recited Act are payable by the chamberlain of the city of London, and the treasurer of the counties of Middlesex, Surrey, and Kent respectively, to the cashier of the Commissioners of Works and Buildings on account of the said official referees and of the said registrar, and all arrears and future payments thereof, shall, instead of being paid to such cashier on such account as aforesaid, be payable and paid into the receipt of her Majesty's Exchequer, and carried to the account of the Consolidated Fund of the United Kingdom of Great Britain and Ireland; *and the salaries of the official referees and registrar of metropolitan buildings for the time being, and all arrears thereof, shall be paid wholly out of the said Consolidated Fund by the Lord High Treasurer or the Commissioners of her Majesty's Treasury for the time being; and such salaries shall accrue from day to day, and be paid quarterly on the first day of January, the first day of April, the first day of July, and the first day of October in every year;* and every official referee and registrar shall be entitled to a proportionate part of his salary from the day of his appointment to the next succeeding quarter-day of payment, and from the last quarter-day of payment preceding his death, discharge from or ceasing to hold the office of official referee or registar (as the case may be) to the day of his death, discharge or ceasing to hold such office.

7. *Public Act.*—And be it enacted, that this Act shall be deemed to be a public Act, and shall be judicially taken notice of as such by all judges, justices, and others, without being specially pleaded.

8. *Act may be amended.*—And be it enacted, that this Act may be amended or repealed by any Act to be passed in the present session of Parliament.

HEALTH IN TOWNS.

On Thursday sen'night, Mr. Traice delivered a lecture on this interesting subject at the City of Westminster Literary, Scientific, and Mechanics' Institution.

The lecturer stated it to be his object to bring under the notice of his hearers a few of the more striking facts, and to accompany these with such reflections and deductions as would naturally arise from the premises. The consideration of the causes which on a large scale affect the health and duration of life of all classes of the community, in various degrees, must have the deepest interest for all parties. It addressed itself to the rich as a question of humanity, and must force on their minds the conviction, that much of their present benevolent outlay for the alleviation of sickness, and its consequences, might, by ordinary preventive measures, be rendered unnecessary, and might be devoted to even nobler purposes of philanthropy. To the middle and labouring classes the obvious and vital importance of the matter must render comment superfluous.

The most cursory glance at the subject would shew, that however great the mortality which we now have to deplore, it is inconsiderable when compared with that which devastated our towns in the 16th and 17th centuries, chiefly from causes which, it is now beyond a doubt, are readily preventible. It is speaking below the fact to say, that full half the deaths in the metropolis and other cities, during the earlier portion of the 17th century, were attributable to a neglect of those sanatory regulations which nature herself dictates, viz., the provision for health-breathing currents of pure instead of mephitic air, and the removal of all matters noxious to the senses. We were much indebted to the labours of Howard, who, undoubtedly, first gave a practical turn to the public mind in regard to the preservation of health among people congregated in dense masses. He explored the filthy dens in which our criminals were immured to engender and propagate the most deadly forms of infection; he proved that we consigned thousands of our fellow-creatures to places where water was doled out miserably, if supplied at all, and where every kind of refuse was allowed to accumulate, diffusing a pestiferous vapour, from whose insidious poison, few escaped without malignant disease. So deadly was this disease, that it was termed the gaol fever; and it is said that 2,000 lives were lost in one fleet, from the fatal infection communicated from some recently liberated prisoners. Now, if we contrast this with our gaols at the present day, we shall find, actually, that they have less sickness than falls to the lot of working people in circumstances of comparative comfort. This has been accomplished, chiefly, by a careful removal of all refuse, the maintenance of scrupulous cleanliness, and the provision of an active circulation of fresh air. In referring to various tables of mortality, which the lecturer exhibited, he observed, that it would be seen that there was a great disparity between different localities and classes of the community; that, as a general rule, the average age of the gentry far exceeded that of mechanics and labourers, and their families, perhaps by two-fifths; that, in some instances, so great was the mortality, that more than half of a given number of children born were dead before reaching their fifth year: that while in some of the rural districts the average age, at death, is among the labouring population thirty-three years, as in Wiltshire, in Bethnal Green it is narrowed to sixteen, and in Liverpool to fifteen years. It was natural to inquire whether any common evil or evils could be detected in uniform association with these respective results; and the question was fully answered by the fact, that wherever it was found that the duration of life is thus "curtailed of its fair proportions," there are none, or very imperfect means, of carrying off impurities; water lies in stagnant pools evolving miasma; pure water is an article so scarce, that cleanliness is utterly neglected, and the inhabitants are crowded into close rooms in ill-constructed houses, and in confined courts and narrow lanes, where the genial breeze can never penetrate unpolluted.

The subject of drainage had been latterly viewed in connection with a most important philosophical principle, namely, that there is no destruction or waste of matter, and that whatever chemical agents are taken from the soil in various vegetable productions, are capable of being returned to it, so as to form one endless series of vitality passing to decay, and the products of decay supplying the conditions of new organic life. This was the rationale of what were called manures, and if it were possible so to arrange, that the refuse of animal existence, which must contain the principal agents of fertility, and are chiefly deposited in drains, sewers, cesspools, could be restored to the soil, it would at once make a great approximation to a practical application of the principle just announced, and would also subserve the great object of economy which has hitherto embarrassed this question; for hitherto while on the one hand we were constantly exhausting the soil of some of its essential riches, on the other we were encumbered and perplexed, and put to enormous cost to get well rid of these ingredients, which however valuable in the field, are pollution and corruption in the city. A variety of plans had been projected to effect this adjustment; among others, he had a model of an arrangement proposed by Mr. Miggs, which consisted of three reservoirs, each adapted to receive the sewage for one tide, and by allowing its heavier matters to subside, and throwing down various organic elements by a free distribution of slacked lime, and constructing tolerably air-tight sheds over it, in which a free evolution of gases should take place to neutralize and precipitate the effluvia; it was considered possible at once to secure all the valuable chemical agents held in suspension by the fluid, and allow the water to pass off almost wholly deprived of its impurities. He could not pretend to give any opinion of this plan, further than to say, that it appeared in entire consistence with the general principles of chemical philosophy, and merited the fullest and most impartial consideration. After pointing out various evils connected with the accumulation of filth, especially in the semi-fluid state, and of the overcrowding of the population; the lecturer referred at some length to the loss, as represented both by suffering and money to the community, from a neglect of due sanatory measures, and said he had contemplated giving a series of suggestions as to the circumstances connected with the securing healthy homes for all, and especially the labouring people. But time would only allow him to recommend that in the choice of a house, they should take great care to ascertain if it had a communication with a sewer, and moreover, if under all states of the weather and tides, the drains carried off *all* impurities, that they should inform them-

selves whether any foul odours at any time prevailed in the house, and if so, to take care that their cause should be removed, or they should have nothing to do with its tenancy; that they should look with the most jealous scrutiny for indications of damp on the basement walls, and that they should avoid those abominable tenements in which there was no outlet back or front from the staircase, which, therefore, formed a *cul de sac*, a depository of whatever foul air might accumulate, to rush into the rooms and increase their closeness, instead of being, as a staircase should be, really a ventilating shaft to the building. The lecturer concluded by strongly exhorting the ladies to attend to the few hints he had ventured to put forth; in every way the most acute sufferers by the excess of disease and mortality were the gentler sex; it was they who felt the keenest sympathy for pain, and it was they also upon whom the incidence of bereavement fell most heavily.

The lecturer appeared to feel sensibly the importance of the subject, and the audience evidently took a lively interest in its exposition.

FREEMASONS OF THE CHURCH.

FORMATION OF PORTLAND VASE.

March 10.—The Rev. G. Pocock, LL.B., in the chair. Mr. W. H. Rosser, F.S.A., exhibited ten encaustic tiles. No. 1 bears a cross between five martlets, the arms attributed to Edward the Confessor, and assumed by the Abbey of Westminster; Nos. 2 and 3, the arms of Beauchamp, Earl of Warwick; No. 4 bears the arms of England, surmounted by the inscription "Fiat voluntas Dei;" No. 7 is a very curious tile, bearing the moral admonition, not to leave deeds of Christian benevolence to be done by an executor after the donor's decease. Mr. Way considers the date of this tile to be about 1450.

A paper was read on the formation of the white figures on the Portland Vase by Mr. Alfred Joseph Stothard; who expressed his surprise that so simple a thing should not have been better understood, and that such a theory as Mr. Doubleday's* should be so widely sent forth in various periodicals without being taken notice of in an equally public manner; that such erroneous views might not be productive of an impression of the impossibility of producing vases of such a character in the present day, induced Mr. Stothard to offer some observations on the subject. He was sorry to differ from one whose opinion he respected, and to whom the public were greatly indebted for many casts of ancient seals. Mr. Stothard reviewed the opinions of Messrs. Doubleday, Pellatt, and Christie, and Miss P. Ensell; with regard to the latter opinion, he ventured to hope that a previous model was made on the vase, from which model an intaglio should be produced for transferring the desired cameo on the vase; if this was not done, that lady's plan would be as tedious and hopeless as Mr. Doubleday's. Mr. Stothard then detailed his method as follows:—Having the body of the vase before me, composed of blue glass, I should draw very carefully thereon the extreme outline of the subject which I was desirous of raising on it. This done, I would pass a layer of varnish over the whole, excepting those parts for my figures; when this is dry then dip the whole into fluoric acid; this will cause such parts as are exposed to the acid to be roughened. I should remove the varnish with turpentine, and then model my subject on the rough ground. The model being finished, I proceed to mould it, with a preparation of lime and plaister of Paris, the former being mixed with the latter, in order to admit of heat without cracking, observing to fix some pieces of clean copper wire about eight inches long into the extremities or finer parts of my model. These wires I should afterwards grease—their use will appear in our progress, and will prove of great importance hereafter. When the mould is complete, being perhaps in three or four pieces, when become hard, or what is termed set, I remove the first portion, drawing out the wire therefrom; but before I remove the second portion I should mark (on the top and bottom of the body of the vase now exposed to view) where the union of these first and second portions met at the sides. I may now safely remove the other parts of the mould, being careful in drawing out all the wires first; the portions of the mould should be well dried, and while that is doing, my model should be cleared off the body of the vase, and the latter well cleansed from grease, but not removing the marks made thereon, top and bottom, when taking off the first portion of the mould. I should then pierce gates or channels through various parts of my mould, these being commenced from the internal part, always observing that they be made through parts of the figures. These channels are made for the passage of the white glass in casting, when the mould is put together on the body of the vase, observing that the outward orifices of these, and where the wires were withdrawn from, should be enlarged for the more free access of the glass when casting the subjects. When enlarging these, it should be done without permitting any part so cut away passing into the channel; this is easily avoided by holding such parts downwards when cutting away. I now put the mould together on the vase, observing that the marks top and bottom are my guides in placing the first portion of it precisely where it was before the removal from the model; having fixed this firmly, there will be no difficulty—the other portions especially—if marked with 1, 2, and 3 notches on the outer edges of the mould; and when all is so fixed firmly together and warmed, it is ready for completing the production of my subjects in glass, which is done by having a vessel of white glass in a fluid state, and pouring a portion thereof into the first gate or channel until full; and such confined air as would prevent the white glass from passing into the extremities of your group will find escape up the apertures left by the wires. When this first part is cool or set, proceed with casting the others. All the gates being filled and the whole nearly cool, place it into moderately warm water, and after one hour the mould will easily relieve or remove, and the parts of the figures to which the gates were attached, should be repaired after their removal, and the surface of the figures polished, as in gem engraving, and the vase be thus completed. Having now reviewed Miss P. Ensell's theory, and suggested my mode to form the figures on the Portland Vase without the aid of petrifying springs, it may be considered by some as impossible, that the glass could find its way into the parts of the subject which were very faint or of low relief. I do not anticipate any such difficulty, but if so, this might be remedied by leaving such parts higher in the model, and a little more time bestowed in reducing it to the desired effect, when finishing off the subjects after they are cast as above described, and the Portland Vase still be made within three or four months instead of as many years, as supposed by Mr. Doubleday. That gentleman, according to his theory, would by covering the body of the vase with a uniform coating or layer of white glass, and then cutting it away until the blue glass beneath its surface appears, only be marring that beautiful form with all its brilliancy of colour previously existing, in order to expend many months fruitlessly to restore it; for no art could equal its original state, independent of the immense labour and study to be bestowed in the production of the figures from the mass left by him for that purpose as in gem engraving.

Mr. Thomas Wilmshurst delivered a lecture on the history of painted and stained glass. This beautiful art, he conceived, is not only restored at the present day to a full equality in producing richness of colour, as compared with the most admired and splendid specimens of the ancient glass; but from the rapid advance of the science of chemistry and the progress made in the art of design, is now capable of being executed in a manner that shall at once satisfy the desire for gorgeous colouring, and the taste of the artist both in arrangement and artistical execution, in which latter particular, many ancient windows entirely failed; that the art of colouring glass was doubtless discovered soon after the invention of glass itself, although as to the date of this invention we have no certain information, no mention being made of glass as applicable to the lighting of temples or dwelling-houses, till after the Christian Era. Whatever may have been the precise period of its introduction, we may readily imagine that the attention of all who laboured at the ornamental arts of life would quickly perceive its adaptation to the adornment of temples and of the palaces of the great, and that when contemplating the ruined fragments that remain, we are astonished at the splendid effects which must have been produced in our magnificent cathedrals before the hand of the destroyer came upon them. In the celebrated basilica of Santa Sophia, in Constantinople, the stained-glass windows said to be of the 6th century, are elaborately wrought in mosaic patterns, and the colours are of great beauty and splendour; but it is in France we find the most perfect and most beautiful specimens remaining of illuminated windows, as it was then under a succession of rich and powerful patrons that the art was carried to its greatest perfection; and the princes as well as prelates of the period seem to have vied with each other in its patronage, and in return, the splendid achievements of their glorious reigns were recorded in the never-failing colours of the art; the sacred history was illustrated in the temples, and the remains of the beautiful creations still form a pleasing but somewhat melancholy record of past history and greatness.

In the middle ages, stained glass was considered so requisite to the adornment of cathedrals and mansions, that few buildings of any consequence were without it. The twelfth century is the earliest period of which we have any stained glass remaining in this country, and fortunately it is in sufficient preservation and quantity to enable us to understand the extremely rich and magnificent effect which must have been produced when in its perfect state. This is the period when the greatest richness in colouring upon glass was effected. The windows in the choir of Canterbury Cathedral are extremely interesting, consisting of panels of geometric forms made with borders of exceeding richness, containing numerous scriptural subjects, and as the figures are all relieved upon deep blue or ruby coloured grounds, they must, before becoming so corroded as at present, have been highly interesting, the intervening portions being all filled with rich and varied colours. There are many windows in the French churches closely resembling these at Canterbury, as at St. Denis, Rouen, &c., and there can be no doubt were executed at or near the same period. It is about the middle of the thirteenth century, that the introduction of heraldic bearings are first observed in stained-glass windows, and shortly afterwards, the figures of kings, saints, &c., were occasionally used, with a canopy of simple form placed over them, the outline of which was principally made out by using glass of different colours. The French, like ourselves, have for some years past been paying great attention to stained glass, and as the Government of that country have made large grants for different works in the palaces and cathedrals, and the king personally interested himself in fostering the art and encouraging its professors, it might be expected that greater strides would be made, and the works executed upon a more correct principle; but it is evident their view of the objects and application of stained glass differs *in toto* from the views entertained by the great majority of its patrons and advocates in this country.

Upon the general introduction of classical architecture, we find very little stained glass was used for some time, and lamentable mistakes were committed, such as removing the mullions of St. George's Chapel, Windsor, in order to introduce a window from a design by West, which was painted by Jervais and Forrest, and the window in New College Chapel, Oxford, painted from Sir Joshua Reynolds' design, is exceedingly poor in effect, and quite inappropriate in character for the beautiful building in which it is placed; but, on the other hand, with our better knowledge of these subjects, there is less excuse for the glaring absurdities perpetrated at the present time, as, for instance, placing a Gothic window in the Roman church of St. George's, Hanover-square. The lecturer considered that with such erroneous examples before us, a better and more correct taste is about to develope itself, and certain and unerring principles will be laid down for guidance, as in other branches of art, and that by a combination of talent, and by taking advantage of the great abilities existing in the country, works will be produced that may be

* See The Builder, p. 106.

a credit to the age, and that future chroniclers of the art may have something more to record than that the English glass painters of the nineteenth century were only remarkable for their subservient and undeviating practice of copying the works of past ages; that they had not sufficient courage or skill to break through the bonds imposed upon them by custom, or by those either regardless or ignorant of purposes of art,—that we shall see designs carried out which, while retaining all the good points of the ancients (and they abound in glorious effects of colour and adaptation) shall keep pace with the immense superiority of high and decorative art, compared with the period when the works referred to were executed, always bearing in mind to preserve the character of the building, and endeavour to carry out upon the glass the feeling and design of the architect. The glass should appear a natural portion of the decorations, without destroying the harmony of the whole, as is unavoidably the case if the windows are left plain, as may be seen in St. Paul's Cathedral, where the observer is continually disappointed and annoyed by the glare of light from the windows, and thus prevented from descrying many of the beauties of the building.

A new era he thought was about to commence in the fine arts of this country, since the prince consort and the Government had decided to give their attention and patronage to them, which will open a vast field for the display of talent, and if a just and liberal spirit seconded the appeal, we might rest assured the result would be such as to do honour to our age and country.

IMPROVEMENTS IN DWELLING-HOUSES.

Sir,—Understanding from the press that it is in contemplation to amend the Metropolitan Buildings Act, I beg your perusal of the following suggestions:—

1st. That in arching all coal cellars, the hole be made as near the curb-stone as possible, thereby allowing more room for the public to pass during the process of shooting coals into the cellars, besides obviating the necessity of carrying them from the wagon; further, they would fall at the back of the cellar, whereas now it is compulsory to have a man below to throw them there.

2nd. That all rain-water pipes be carried to the bottom of the house to the drain, thereby avoiding the overflowing of the footpath.

3rd. That in all future new buildings and alterations, it shall be compulsory on the builder to make an ornamental ventilation in the ceiling of every room.

4th. That every builder be compelled to build a brick, or fix a stone, iron, or other substantial basin to every water-closet, which, besides being a very important desideratum towards public health, will prevent the drains from being so frequently stopped up.

5th. I would suggest that all water-cisterns for domestic purposes be abandoned, and that there should be a continual supply of water by a water-cock, placed on every floor in the house, thereby affording also a purer supply than has heretofore been had; as I know that cisterns are not often cleaned out. There should be no stint in the supply of this most useful article. Under the present system there is much waste; many houses have no ball-cock fixed to the supply pipe.

6th. That it shall be compulsory on every landlord to fix a bell in every room in the house, all communicating with one handle at the street door; to have engraved thereon, "alarm bell," so that in case of fire it would afford an effective mode of arousing all the inmates at one and the same time, to a sense of their danger; and that there be a punishment for any person wilfully ringing the bell without just cause.

I beg to subscribe myself, your humble servant, C. Candland.

36, Brownlow-street, Drury-lane.

*** As hints to builders and others, these suggestions (not now made for the first time) deserve consideration; but we are not prepared to recommend that even the best of them should be *enforced* by Act of Parliament.

Royal Academy of Arts.—A notice has been issued that all works intended for the ensuing exhibition must be sent in on Monday, the 6th, or Tuesday, the 7th of April next.

THORNTON ABBEY, LINCOLNSHIRE.

By the kindness of Mr. J. H. Parker, we are enabled to transfer to our pages, from "The Archæological Journal,"* the following illustrated account of Thornton Abbey, Lincolnshire, written by him. The building, as will be seen, has some remarkable features, and the account will be read with interest, especially by those who are seeking to learn with accuracy, the precise date of the various changes which took place in the pointed style of architecture.

In that essentially church building age, the twelfth century, William le Gros, Earl of Albemarle and Lord of Holderness, grandson of Odo, Earl of Champagne, one of the followers of the Conqueror, was distinguished among the Anglo-Norman barons for his liberality towards the religious orders. Besides the house of Albemarle in Normandy, three stately foundations in England—the Cistertian Abbeys of Vaudey, or de Valle Dei, at Edenham, in Lincolnshire, and of Meux, in Yorkshire, and the Augustinian Monastery of Thornton-upon-Humber, acknowledged him as their founder. He died in 1180, and is recorded by the grateful chronicler of Thornton as "an eminent founder of monasteries."†

Thornton Abbey was the first in point of date of his establishments in England. It was founded on the feast of St. Hilary A.D. 1139, the fourth year of King Stephen. In the following year and on the same feast of St. Hilary, which fell on a Sunday, Waltheof,‡ a kinsman of William le Gros and prior of Kirkham in Yorkshire, went to Thornton, taking with him twelve canons of Kirkham, whom he established in the new monastery, constituting one of them named Richard, the first prior. He was afterwards made abbot by a bull of Pope Eugenius the Third.

It seems probable that at this early period and for many subsequent years, the buildings were merely of a temporary nature. We learn from the chronological history of the abbey, a valuable manuscript to which reference will be made hereafter, that the stone for the great altar was purchased in 1262, in which year the dormitory was roofed. In 1263 the foundations of the body of the church were laid,§ and it was still building in 1282, when the chapter-house was begun. The choir of the church appears to have been covered in by the year 1315, when certain payments were made for painting the roof; and the chapter-house, which was commenced in 1282, was paved in 1308. In the year 1323 a new cloister and kitchen were built; the former was roofed in 1325, in which year we find an entry of payments for the foundations of the columns of the church, possibly of the nave. The presbytery in the choir was built between 1443 and 1473.

Thus it appears that the church alone was in progress during a period of nearly two centuries: and perhaps no better materials are extant for illustrating the gradual advance of a great monastic edifice than those collected by the curious, but nameless, monk of Thornton, who, in the early part of the sixteenth century, when the abbey was yet flourishing, and all its muniments were in existence, applied himself to collect the names of the "masters of the fabric," and to discover the dates of the several parts of the building.

After increasing in wealth and power under a succession of twenty-three abbots during a period of 402 years, the community of Thornton was suppressed‖ in 1541, and a portion of its revenues applied to the endowment of a college, consisting of a dean and prebendaries, dedicated to the Holy Trinity. This establishment lingered till the accession of Edward the Sixth, when it shared the fate of the abbey.

A curious discovery was made more than a century ago during some excavations near the chapter-house. It was first mentioned by Stukeley,¶ who visited the ruins in 1722; he says, "that upon taking down an old wall there, they found a man with a candlestick, table, and book, who was supposed to have been immured." Tradition has always asserted that it was an abbot who suffered this punishment, and it may be worth while to inquire how far popular belief is in this case correct. Two of the abbots of Thornton were persons of doubtful reputation. Thomas Gretham, the fourteenth abbot, was deposed in 1393. The author of the MS. history gave him so bad a character, that a possessor of the work in the last century tore out a leaf containing the account of his abbacy "to prevent," says Tanner, in a note to the volume, "scandal to the Church;" thus in the absence of this leaf we are compelled to rely upon the next suspicious entry in the book. Speaking of Walter Multon, eighteenth abbot, the writer says, under the year 1443, "he died, but in what manner or by what death I know not. He had no obit, as the other abbots have, and the place of his burial hath not been found." It is almost impossible to doubt that this significant passage has allusion to the fate of Walter Multon, who expiated his unrecorded offences by suffering that dire punishment, which we have reason to believe the secret and irresponsible monastic tribunals of the middle ages, occasionally inflicted upon their erring brethren.*

The only part of the buildings of this abbey which remains at all in a perfect state is the entrance gatehouse. This is one of the finest existing in any part of England, and presents some remarkable features. It is of the perpendicular style, and was built soon after the sixth year of Richard the Second, A.D. 1382, the date of the license to crenellate it. Many of its details are extremely beautiful (see engravings). The approach on the exterior is over a bridge across the moat, protected on both sides by massive brick walls, with an arcade of pointed arches on the inside, supporting a wall or alure behind a parapet, and a dwarf round tower at the end of each. These were evidently adapted for defence, and are of a later character than the gatehouse itself, perhaps as late as Henry the Eighth; but there is the groove of the portcullis in the jambs of the outer gateway *a*, fig. 3, as if it had always been intended for defence; the disturbed state of the country, or the dread of invasion, it being near the mouth of the Humber, probably rendered the additional outworks necessary at a subsequent period.

The gatehouse itself is built chiefly of brick, cased with stone; the outer face, or west front, is partly of brick, with stone dressings, the design being very rich and elegant: the entrance gateway is ornamented with three shafts in each of the jambs: its pointed arch is richly moulded, with flowers in one of the hollow mouldings; over this is a segmental arch, with hanging foliations: the side arches are partly concealed by later brickwork, but do not appear to have ever been open.

This west front of the gatehouse is divided by four octagonal turrets into three compartments; in the centre are three elegant niches, with the figures remaining in them, and rich canopies: in each of the side compartments is a similar niche, one of which also retains a figure. The archway is groined, and has finely sculptured bosses and moulded ribs springing from good corbels, panelled in the lower part. The upper part ornamented with foliage like the capital of a pillar. The manner in which the mouldings of the ribs are made to intersect each other at their springing is very clever and interesting (fig. 7). The whole of the mouldings of this gateway are remarkably bold and good *early* perpendicular, built soon after 1382.

The east front or inner face of the gatehouse has also four octangular turrets, but is of plainer character than the outer face. Over the gateway is a very elegant oriel window of bold projection, springing from a corbel, with a stone roof, and pinnacles at the angles; the lights are divided by transoms: over this is another window of four lights with a flat arch. The turrets have all lost their original terminations, and it is difficult now to say in what manner they were finished, but probably by a battlement, as Mr. Mackenzie has conjectured.

The room over the gateway, lighted by the oriel window, is of considerable size; it is approached by a winding stair in one of the turrets, the top of which has a very good

* Longman, London; Parker, Oxford.

† "Præclarus comes, et eximius monasteriorum fundator." MS. Tanner. No. 166, Bibl. Bod.

‡ Wallevus: his name does not occur among the priors of Kirkham in the last edition of Dugdale's Monasticon.

§ Fundamentum ecclesiæ corporis.

‖ At the Dissolution it consisted of six monks, with the following servants:—a larderer and pottager; a master cook, with three boys; a cow-herd and two boys; two swine-herds; a carter and poulterer; three gardeners and their boy; a curer of herrings; the sub-cellerer's boy; a messenger, and a keeper of ducks or wild fowl.

¶ Itinerarium Curiosum.

* The skeleton of a nun thus immured was found some years ago at Coldingham Abbey. Another instance was recently discovered at Temple-Bruer, in Lincolnshire.

PARTS FROM THORNTON ABBEY.

Fig. 1.

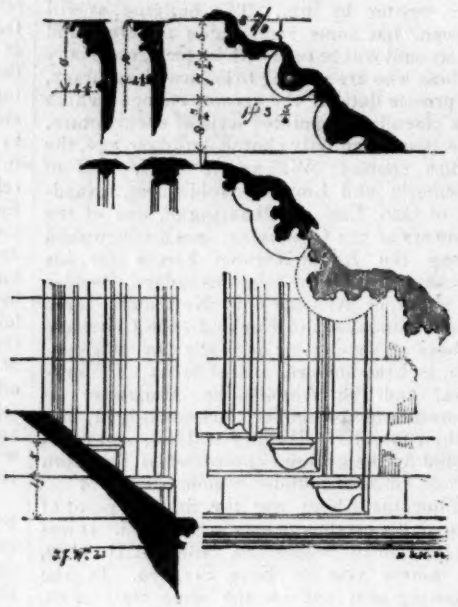


Fig. 9.

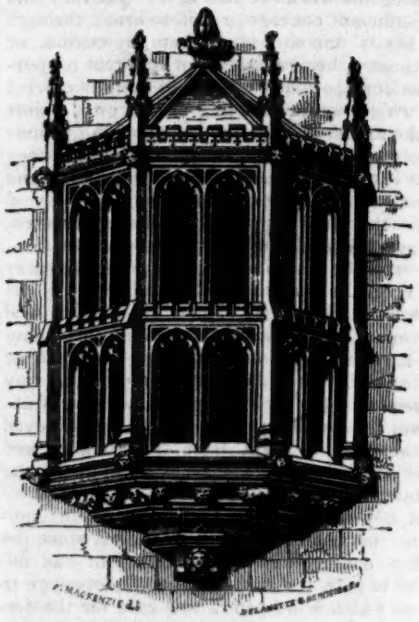


Fig. 2.

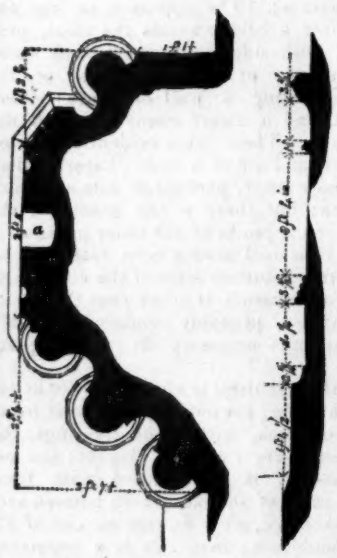


Fig. 3.

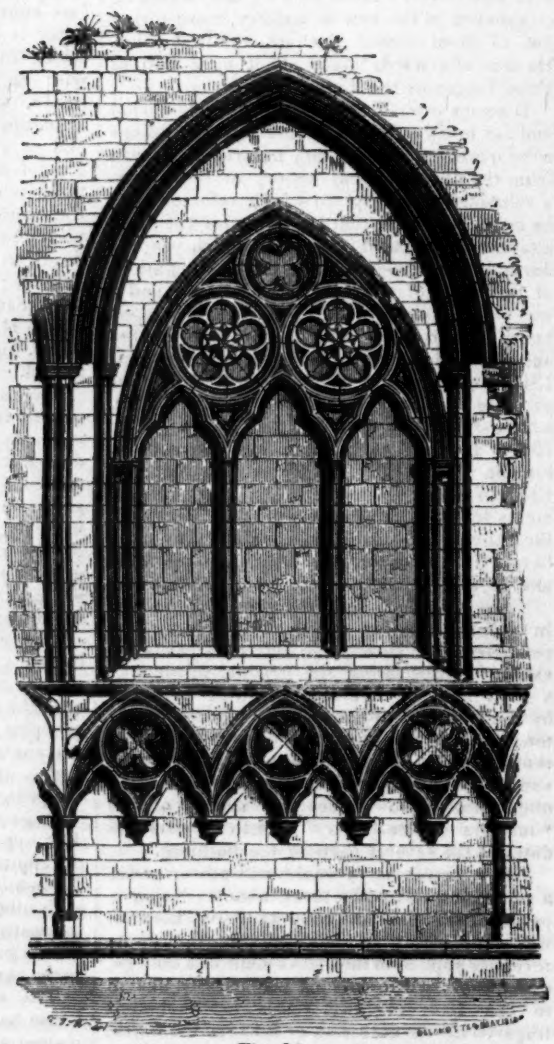


Fig. 10.

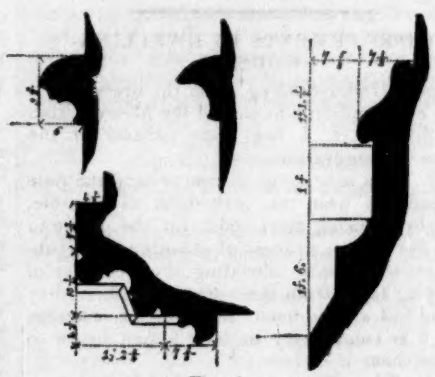


Fig. 6.

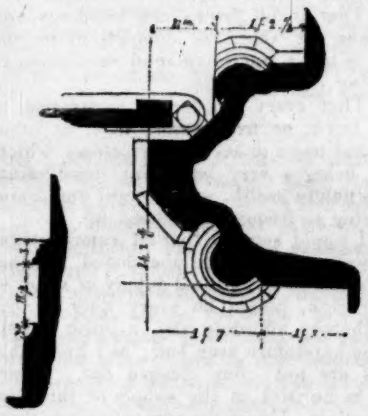


Fig. 5.

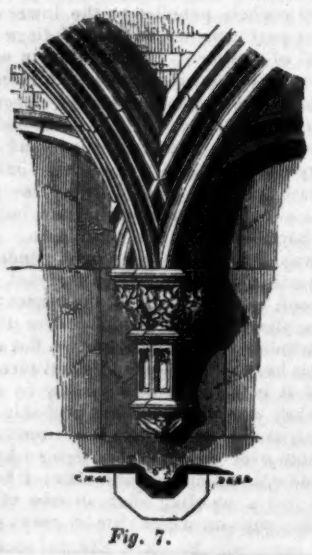


Fig. 7.

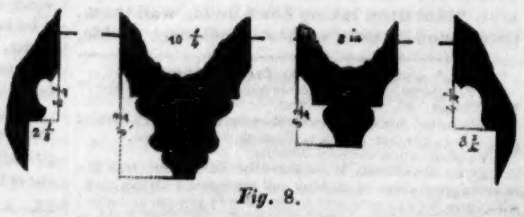


Fig. 8.

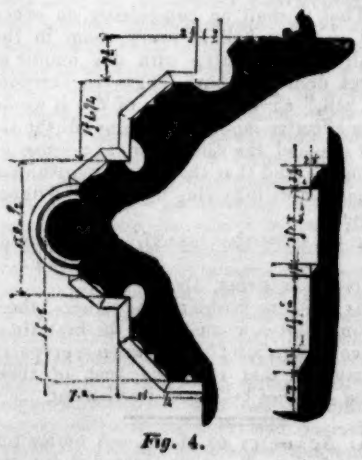


Fig. 4.

groined vault, with foliated ribs of singular but elegant design. From its large size, and the buildings attached to it on either side, it appears probable that this gatehouse was the residence of the abbot.

Some of the other domestic buildings of the abbey remain in a more or less ruinous state; they are of the thirteenth century, and retain their groined vaults with arched ribs only, which spring from the walls without shafts or capitals, or even moulded imposts, the arch merely dying into the wall. The keys of these vaults are ornamented with bold and good Early English bosses, the sculpture of which is very free and characteristic.

Of the chapter-house two sides are tolerably perfect, ornamented with panelling, in imitation of a window of three lights, with foliated circles in the head, and an arcade under it, the whole of very good Early English work, beautifully moulded, the date of it being, as already stated, circa 1282, early in the reign of Edward the First (fig. 10). Some small portions of the church remain, and belong to nearly the same period. One aisle of a transept has its vault and arcades on each side of very singular Early English work, with corbels in the place of capitals. There is one window, or rather panel, of three divisions, with three foliated circles in the head, filled up with a sort of fleur-de-lis; under this is an Early English piscina.

The mouldings of this work are very good, as will be seen by their sections given above. They are Early English, but late in the style, approaching to the Decorated. A comparison of these remains with the choir of Merton College Chapel, Oxford, built at the same period, will go far to prove that in the beginning of the reign of Edward the First the change of style was in rapid progress, and that works previously commenced were finished in the earlier style, while new buildings then begun were in the later.

Description of Engravings.

Fig. 1. Window of second floor, east front of gateway.
Fig. 2. Oriel window in gate-house, *circa* 1382.
Fig. 3. Jamb of entrance to gate-house, north front.
Fig. 4. Jamb of east front of gate-house.
Fig. 5. Jamb of archway on which the doors are hung. Archmoulds the same.
Fig. 6. Jamb of door south side. Base mould of west front. String of turret of east front.
Fig. 7. Corbel shewing springing of rib between gate-arch and east archway.
Fig. 8. Details of groining of gate-house.
Fig. 9. Details of window of chapter-house, A.D. 1282.
Fig. 10. Elevation of north-east bay of chapter-house, *circa* 1282.

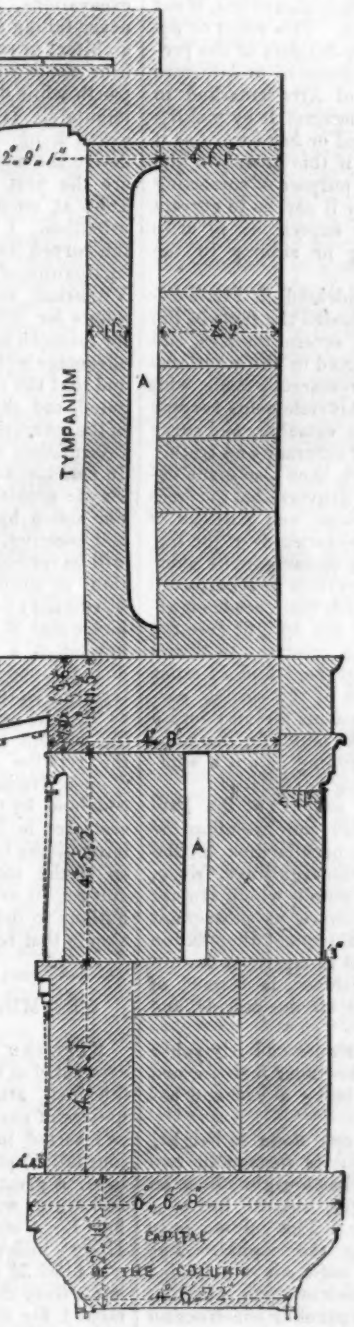
ON CERTAIN PECULIARITIES IN THE DESIGN AND CONSTRUCTION OF THE PARTHENON.*

BY J. J. SCOLES, ARCHITECT.

Mr. Penrose has given us some interesting information respecting the curved lines of this once magnificent building, which shews the refined state of Greek art at the period this temple was built, and the great attention paid by the artists of that nation to make their buildings as effective as possible, by counteracting, when possible, those optical delusions common in all buildings. It is well known to architects, that if the shafts of columns are made perfectly straight, that the effect to the eye would be an appearance of curving inwards; and this unpleasing effect is remedied by giving an entasis or swelling to the columns. As Stuart and Revett had not shewn any entasis to the columns of the Parthenon, I felt a desire, when I was at Athens, to ascertain if the architect of the Parthenon had overlooked this point, if these columns were really executed without any entasis; I had the opportunity of measuring each diameter of the blocks of a fallen column, which clearly proved that an entasis was given, but so slightly as not to give any appearance of swelling out, which is so often seen in the buildings of Italy, but yet sufficient to correct the defect that would have been apparent if the shafts had had a straight line. I have much pleasure in bearing testimony to the satisfactory researches of Mr. Penrose on this point, whose calculations of the diameter of the various stones, on the assumption that

* Read at Institute of British Architects 23rd ult.

PARTHENON—CONSTRUCTION OF ENTABLATURE.



the curve was a hyperboloid, came so near my actual measurements, as to prove not only the accuracy of his theory, but also the inaccuracy of one of my dimensions, which produced at one part a cripple to the curve when drawn out, and must, in execution, have been very perceptible, and which his formula easily detected.

The necessity of giving "entasis" to the sides of tapering shafts was not overlooked by the architects of the middle ages; for if I remember rightly, this fact was brought to our notice by our honourary secretary, Mr. Poynter, at one of our meetings, when the subject of the restoration of Redcliff Church, Bristol, occupied our attention; and that gentleman remarked, that the spires of our Gothic churches had that swelling or deviation from a straight line; and Professor Hosking, who favoured us with his remarks on the restoration of this church, corroborated Mr. Poynter's statement by instancing the spire of this building, which, though only partly erected, shewed a deviation from a straight line.

I question if the architects or builders of the middle ages formed their entasis on the geometric principles of *Ictinus;* but without disparaging their mathematical knowledge, I am inclined to think they worked very often by what is sometimes called the "rule of thumb," and perhaps like many of the Italian architects of that period, and also like many workmen of our own time; in the west of England they worked the sides of their spires and columns from the base upwards to one angle, a portion of the height, and the remainder to a more acute angle, perhaps cutting by the eye the junction or angle formed by these two inclines. As in some manner connected with entasis, I would beg here to remark more particularly for the use of our younger members, that the antæ in Greek buildings have a slight diminution, sufficient only to prevent the upper diameter appearing larger than the lower one, which is invariably the case where the diameters at each end are the same. I allude to this diminution in the antæ because many writers have laid it down as the law, that Greek antæ do not diminish, but in all the instances I have met with the diminution is to be discovered.

Mr. Penrose has ascertained, that not only the Parthenon but also other buildings of Greek architecture have the steps, architrave, cornices, &c., curved upwards in the centre; I had heard rumours of late years to the same effect respecting the Parthenon, and I was inclined to attribute this deviation from the straight line to some defect or sinking at the extremities; but from the information I have received from Mr. Penrose, whom I have questioned very closely on this subject, with reference to any appearance of settlement or displacement of the stones or separation at the joints, I now quite agree with him, that these

deviations are not the result of failure in the construction of the buildings, but that the deviation has been the result of preconcerted design, to prevent the appearance of depression in the middle, which an extended horizontal line of cornices, beams, &c., always has, if not raised a little in that part. This effect or defect is well known to barn-builders of the present day, who as the professor of architecture in the Royal Academy of Arts remarked in his last lecture, provide against it by making the ridge of the roof round or *hog-backed* as it is termed, but I question if this raising in the middle is entirely for the purpose of correcting the visual delusion. May it not be to correct a defect they know from experience to arise from the roof swagging or sinking in the middle?

We are very much indebted to Mr. Penrose for having communicated the facts of the curved lines existing in several temples, and as his attention was directed to the ascertaining of this fact, and his researches made with reference to that object, his statements become in consequence the more valuable, and carry with them the impress of accuracy and truth.

Some observations have been also made respecting a direction of Vitruvius, that the faces of the architrave and frieze, and portions of the cornice should incline forwards at the top. I can only say, that my measurements shew the Parthenon to be the reverse as regards the architrave and frieze, which both recede eight-tenths of an inch from the upright (see the annexed sketch): and on referring to Stuart and Revetts' works on Athens, I find a similar coincidence, but the face of the corona certainly does incline as Vitruvius directs; future researches may decide the point, for the non-existence of it at one building is not a sufficient authority for deciding the question.

Before dismissing the subject of the Parthenon, I would beg to call your attention for a few minutes to some peculiarities in the manner of constructing the architrave, frieze, and other parts of this temple which are not shewn so distinctly in Stuart, as subsequent researches and perhaps subsequent dilapidation has enabled others as well as myself to do.

The architrave, for instance, is formed of four stones, three visible on the outside, and one not seen externally.

The frieze has the metopes and triglyphes rebated together, and the inner face formed by distinct stones, there being a vacancy between; see A in figure.

The outer cornice is one stone in height, and within the perystile it is formed in two stones. The tympanum has upright stones on the outside, in the height, but the inside is formed in seven courses. The column is in twelve stones including the capital. The upper moulding of the pediment is hollowed out at the back, and a block of stone is laid on it; but the object of this peculiar construction is not very apparent, and has not been satisfactorily explained by any one whom I have consulted. The annexed engraving, from accurate measurements, will explain the construction clearly.

The beds of the various stones composing the columns, are sunk about three-quarters of the tenth of an inch, leaving a raised margin about an inch and a half on the outer edge. The side walls of the cella are single blocks the whole width of the walls; with this latter exception, we see that the temple is not constructed of large, although it is of solid pieces of marble, but of rather small blocks; but the whole is so accurately and beautifully worked, and solidly bedded, that the joints are in many parts not perceptible, and even in the ruined state of the side walls, which are in great part thrown down, it was with difficulty my fellow-traveller, Mr. Catherwood, and myself, could find the vertical joints of these walls.

Before resuming my seat, I perhaps may be allowed to remind our younger members, who may be contemplating a tour to the sunny climes of Greece and Italy, that fresh subjects of research are now open to them. It has often been remarked by those about to travel, that it is useless to measure or draw the antiquities; that the buildings have been so often measured, drawn, and published, that every thing about them is well known. Who can beat Stuart in accuracy? some say; but let these gentlemen bear in mind, that opportunities for further investigation are constantly occurring. The very dilapidations of the buildings afford means of discovering their mode of construction, which the building in a more perfect state did not disclose to a former traveller: the removal of incumbrances, excavations, and other discoveries, afford a never-failing subject for the investigation of an architect of research and observation; and if it be worth while to draw and measure, it is worth while doing so accurately, carefully, and minutely. It is an old adage, that what is worth doing is worth doing well. Those also derive the most advantage in their travels who are the best prepared beforehand, for they know at once to what object to direct their attention. I hope they will bear in mind that the curved lines, the painted decorations, the inclination of the high columns mentioned by Vitruvius, and also of the entablature, are points for investigation, and open a new field for research and application; but have no doubt advantage will be taken of these late discoveries, and that the subjects will be carefully investigated, and that we shall be indebted to some of the members around us, for much interesting information and particulars on these points. In conclusion, I trust that as the subject of classic architecture has been again brought to our notice by the papers read at this and our last meeting, the study of Greek architecture will be revived, and looked upon as the foundation or ground-work (to speak rather professionally) for the study of architecture. I am aware that of late years our course of practice has taken a different channel; but fashion changes, and we may live to see "pagan architecture," as it is sometimes termed, rank again as fit to be used even for Christian purposes; but without attempting to offer an opinion on the relative merits or capabilities of Greek, Roman, Italian, or pointed architecture, I will conclude by observing, that as travelling to an architect is like the university to a man of letters—the last stage of a regular education; so is the study of classical models to the student in architecture like that of the classic authors to the scholar and gentleman, the first step to that regular education.

WESTMINSTER COURT OF SEWERS.

Between forty and fifty commissioners assembled at the ordinary court on Friday, the 6th inst., attracted, no doubt by the various notices of motion given at the previous court, as inserted in the preceding number of our journal. Capt. Bague, R.N., was chosen chairman. A great number of applications for sewers and drains were granted. Some appeals were heard. A clerk of the works (of the name of Hogg), under the office of Woods and Works, was fined 5*l.* for refusing to attend to his summons from the court. Hogg was then re-summoned for the next court, with the intimation that he would be more severely fined if he still continued to treat the court with contempt.

At 2 o'clock the important business commenced, by Mr. Mayhew expressing a wish to simplify the discussion of the court by withdrawing his motion, as it was his intention to support the appointment of Mr. Phillips by voting for Mr. Cumberlege's amendment. The court allowed Mr. Mayhew to withdraw his notice of motion.

Mr. Le Breton said he had no voice to make a long speech, and therefore he would very briefly state his views. The court had refused to fix the salary of chief surveyor at either 400*l.* or 500*l.* or 600*l.* a year. He begged to assure the court that he was no party to the notice of motion on the day's business-paper, which had for its object the bringing back Mr. Hawkins at a salary of 450*l.* a year. He thought the officer wanted should be an engineer of eminence, and the appointment thrown open to public competition. He would therefore move, and was seconded by Mr. Wm. L. Donaldson—"That all the orders of court of the 13th Feb. 1846, as to the surveyor's salary, be rescinded, and that the salary of such surveyor be 500*l.* per annum, and that steps be taken to invite candidates for such office."

Mr. Cumberlege moved the amendment of which he had given notice, to the effect—"That Mr. Phillips be forthwith appointed, at a salary of 250*l.* per annum, to the office of chief surveyor, on a trial of six months, on account of the vacancy which has so long subsisted in that office, and that all orders of court which interfere with this appointment be rescinded." Seconded by Mr. Branscombe.

Mr. Cumberlege proceeded to shew that much, in his opinion, of the doubt and delay had arisen, from the extravagant notions of the qualifications of the chief surveyor entertained by some commissioners. The terms surveyor and engineer had most extensive signification. Sir Christopher Wren was the surveyor of St. Paul's; Inigo Jones, surveyor of the king's buildings; Sir John Vanburgh, surveyor of the palace of Woodstock, and every architect, however eminent he might be, was the surveyor for the time being of the particular work in progress. The term engineer had also its extensive signification: works incidental to a long line of railway, a breakwater, bridges, such as that now erecting over the Danube, where the water was 25 feet deep at low-water, and the freshes so immense, that the waters rose with great rapidity above 30 feet. It was evident the court required no such surveyor or engineer, yet to listen to some honourable commissioners it would be supposed an absolute necessity to have such talent, and that it could be obtained for 400*l.*, 500*l.*, or 600*l.* per annum. These appeared to him exaggerated notions of the requirements, fallacious in themselves, and impossible to procure in any officer likely to accept the surveyorship of the sewers in the Westminster jurisdiction. The honourable commissioner then proceeded to read extracts from the printed statements of the former chairman of the court, Mr. T. L. Donaldson, as to that "great king of dykes," the King's Scholars' Pond Sewer. Notwithstanding the immense encomiums lavished upon that work, he (Mr. Cumberlege) was aware, as well as the court itself, that it had not escaped the charge of being now even a greater nuisance than the nuisance it was intended to remove. The court should now turn from the imaginary picture, from "the faultless monster that the world ne'er saw," to the actual person wanted by the court to fill the office of chief surveyor. He would not be required, like Wren, to build cathedrals, or, like Inigo Jones, to build palaces, nor to build railways, bridges, or viaducts; but to build, rebuild, or repair sewers which, under ordinary circumstances, average 5 or 6 feet in height, by 2 or 3 feet in width. Now these works, he admitted, required considerable judgment, skill, and science; but then it was only judgment, skill, and science in a comparatively limited field. The surveyor wanted by this court must, to do his duty properly, be for hours and hours in the sewers. How could that able report of Mr. Phillips, on the Lisson-grove district sewerage, have been in the hands of each commissioner had not Mr. Phillips been for a length of time in all those sewers? Mr. Cumberlege then stated that he had forwarded Mr. Phillips's report, plan, and section of what he had proposed to do in that district, to Mr. Roe, the eminent engineer of the Holborn and Finsbury sewers, and also asked that gentleman to favour him with his opinions as to Mr. Phillips, qualifications for the office of chief surveyor to this court. He then read the reply.

Sewers Office, Hatton-garden,
March 5th, 1846.

Sir,—In reply to your inquiry, I beg to state that I consider your amendment one that would tend (if carried) to serve the public interest. I believe Mr. Phillips to be competent for the situation; so much so that I have no hesitation in saying that I know no one more likely to do your commission eminent service, should you succeed in giving him an opportunity for a trial.—I am, Sir, yours truly,

C. N. Cumberlege, Esq. John Roe.

N.B. Mr. Phillips's report on Stephen-street, &c., &c., does him much credit.

It was because in his opinion that Mr. Phillips possessed the abilities to fill the office of chief surveyor with credit to himself and advantage to the public, that he had put forward the amendment. The treatises on sewers by Mr. Phillips' published in The Builder, shewed great originality, and they were distinguished also by their intelligence and common sense. Mr. Phillips was also now preparing for publication a new treatise on sewering, with illustrations, which proved his industry and the great interest he had in the subject. Let him, therefore, by the vote of this day, have the six months' trial which the

amendment proposed; let him have that trial with fairness, forbearance, and encouragement, and the firm conviction on his (Mr. C.'s) mind was, that the court would never repent that it had been induced to make that trial.

Mr. Cantwell opposed the appointment of Mr. Phillips, though he admitted that it was high time that some appointment should be made; he thought it ought not to be a temporary one, and that it should be done after public competition.

Mr. T. L. Donaldson objected to Mr. Phillips. He was a very good clerk of the works; but not fitted to be the chief surveyor; he was totally without education. It might be well for gentlemen to depreciate education when they were supporting a mere practical man, and say he was competent to the duties; but the man of professional education, possessing the higher acquirements, pre-supposed the lower qualifications of the mere practical man. He (Mr. Donaldson) would ask the court why should it care about the opinion of Mr. Roe as to the qualifications of Mr. Phillips. He totally disagreed with Mr. Roe about Mr. Phillips' report on Stafford-street, Stephen-street, Lisson Grove, in which report Mr. Phillips had actually recommended a length of the third size sewer beyond what the orders of the court allow. He (Mr. Donaldson) was astonished that Mr. Cumberlege should go out of the court to seek for an opinion as to Mr. Phillips, when there were so many competent commissioners present. The reports of this court ought to have enlarged views of the necessities of the districts, and it was owing to false economy in the commissioners that comprehensive views were not often carried out. The court must bear in mind, that sewage had entirely changed its character within the last few years. Formerly only surface water was admitted, then the soil from houses, and now macadamized silt, which was insoluble in water, found its way into the sewers. As to great works, the Ranelagh sewer would soon require a new outlet, and for a mile in length a great expenditure. In almost every parish, also, great outlays were required. In the parish where the court now assembled from twenty to thirty thousand pounds were wanted. The honourable commissioner, Mr. Cumberlege, had laid great stress upon finding a man willing to go into the sewers for hours together! why, Mr. Hawkins had spent days and days in the sewers, and the reports he had made to this court did that gentleman infinite credit. His report on the quantities of soil discharged by the various sewers into the Thames had been quoted by the scientific writers of the day. If the court limited its views of Mr. Phillips to the office of clerk of the works, it would do well; but if from the inferior office he should be raised by the vote of this day to that of chief surveyor, he (Mr. Donaldson) should regret it.

Mr. Broughton said he should not follow all the remarks that had been made either for or against Mr. Phillips; for from his long absence from the court by his engagements elsewhere, he absolutely knew nothing about the subject. But from looking at the business paper of the day, it appeared to him as if chaos had come again. The salary had not been fixed for the officer they wanted to appoint; 400*l.*, 500*l.*, and 600*l.* had all been proposed and negatived, and now 250*l.* was proposed by the amendment. Then another motion was to follow, proposing Mr. Hawkins at 450*l.* Now, whether 450*l.* was too much, or 250*l.* too little, or whether Mr. Phillips was the right man or Mr. Hawkins, he confessed he was entirely ignorant, and it therefore was quite impossible that he should vote for any of the propositions. In his opinion, all the preliminaries should have been arranged either by the court or a committee.

Mr. Leslie said, that it was only on very great occasions that the court was favoured with the attendance of the honourable commissioner who had just sat down. It was always a satisfaction to him to see Mr. Broughton in his place, as if the court should not always be very much edified by his speech, they were certain to be very much amused by it. The honourable commissioner had said chaos was come again. But as he had been so long absent, he probably was not aware by whom chaos had been introduced. He (Mr. Leslie) had in his hand a return, made out from their own records, which shewed that it was exactly five months ago since Mr. Hawkins, the then assistant surveyor resigned, at which court, on the 3rd of October last, he moved "that Mr. Hawkins' resignation be accepted, and that he be at liberty to leave at his own convenience;" that motion the court altered by putting in the word "forthwith." At the same court he gave notice of motion, that Mr. John Phillips should be appointed to succeed to the vacant office of assistant surveyor; and on the 7th of November, chaos commenced, introduced in the shape of an amendment to the motion for Mr. Phillips' appointment "to consider the efficiency of the surveyor's department;" the votes were equal when the last, of the annual chairman (Mr. Willoughby), gave the casting vote in favour of the amendment. The court would do well to remember that the new system of doing all works under 50*l.* without a contractor was to commence the next morning. On the 14th November, the court voted that the surveyor's department was inefficient. On the same day, Mr. Thomas L. Donaldson and Mr. Allason carried a vote "To appoint a new chief surveyor," and that Mr. Dowley should be shelved under the title of consulting surveyor at 200*l.* a year. Then Mr. Doull, the assistant surveyor, was swept off under another vote "that there be no other than the consulting and chief surveyor." Then Mr. Le Breton continued his chaotic course, by getting the court to vote that all the orders relating to an assistant surveyor be rescinded, and the duties of the new chief surveyor were defined on the 16th January last. Then 600*l.* a year was proposed for the new chief, and he Mr. Leslie seconded by Mr. Cumberlege, carried an amendment to the effect, that it was not expedient to invite candidates until after six months' trial of Mr. John Phillips, whose forms of sewers had been adopted by the court: 10 for the amendment, 8 against it. At the next courts, rescinding and revoting and rescinding followed. And at the present court, the identical motion of which he had given notice five months ago, would, he had no doubt be carried this day by the appointment of Mr. Phillips as chief surveyor, although in the origin, it was intended to appoint him as assistant surveyor. So much for their chaotic courses.

Mr. White objected to Mr. Phillips as *chief* surveyor, but would have voted for him as second surveyor. He also objected to the report which had been printed of the Stafford-street sewer. The digging was too deep, and had the old sewerage brought down to it on an incline.

Mr. Dodd, M.P., declared that he would vote for Mr. Phillips; he was satisfied he was a man of great talent, and one that would soon make up for the want of early education.

Mr. Gunter declared the same thing very earnestly.

After a very lengthened discussion, the amendment was carried. For Mr. Phillips's appointment as chief surveyor, 19: Hon. P. F. Bouverie, Hon. F. Byng, Capt. Bague, Messrs. Biffin, Branscombe, Chambers, Cumberlege, Dodd, Fuller, Godrich, R. Gunter, Hall, Leslie, Mayhew, Pownall, Unwin, Willmott, Wood, and Vale. Against it, 17: Messrs. Allason, Bathurst, Broughton, Cantwell, Chalmers, Crace, Drew, T. L. Donaldson, W. L. Donaldson, Gutch, Hawkes, Kendall, Knight, Le Breton, Moss, Perry, and John White.

Captain Bague, the chairman of the day, then sent for Mr. Phillips, and informed him that he was appointed chief surveyor for six months, at a salary of 250*l.*, and hoped that he would pay every attention to the important duties of his new office.

Mr. Phillips briefly returned his thanks to the court for the honour done him by the appointment, and assured the court that it might rely upon his faithfully, to the best of his abilities, discharging the various duties of the appointment.

Fire Escapes.—With reference to a paragraph in a recent number, headed "Fire Brigade, Paris," a correspondent says, that at the suggestion of Mr. Deputy Stevens, the commissioners of sewers of the city of London caused a deep orange-coloured lamp, with the words "*Fire Escape at the Bull*," in *white* enamelled letters, on three of its sides, to be set up in Bishopsgate-street Within, many weeks ago.

EXTENDED USE OF GAS—STATE OF THE MAINS.

The use of gas in dwellings has greatly increased within the last two or three years, but by no means to the extent which may be predicted for it, if the proper steps be taken. Let it be cheapened, as it may be, and *means for efficient ventilation obtained*, and in a very short time a house not supplied with it will be an exception from the general rule.

Builders will lay down the pipes for it in new houses, as they now do for the water, and the community will be much advantaged.

"A remarkable circumstance," says Mr. Rutter, of Brighton (in a little pamphlet on the "Ventilation of Gas-lights,")* connected with the progress of gas-lighting is that, of the many thousands of persons who have availed themselves of gas, never doubting that it was indispensable in their business transactions, so small a proportion, until very recently, should have thought it equally necessary to the comfort and convenience of their families. Those connected with the manufacture and sale of gas are in this matter more to blame than their customers. So far as the consumers of gas are concerned, their apparent indifference to its use in their private apartments is the result rather of passive acquiescence in present arrangements, than of any real objection to further improvements. In many cases the cost of fittings, or the annoyance of having workmen about, may still operate as an insuperable difficulty. Let there be ever so large a deduction made for all kinds of objections and of prejudices, a vast number of persons remain who only require to have the subject brought judiciously under their notice, accompanied by an offer of advice or explanation by a competent authority, and they will use gas in their drawing-rooms, and bed-rooms, as readily as they now do in their counting-houses and shops."

The companies must be up and stirring. If they sleep much *longer*, they will find themselves when they wake at the foot of the hill. Though dealers in gas, they seem to require enlightenment.

Sir,—I have already called attention to the dangerous state of the gas-pipes underground, and the want of judgment and care shewn in their laying and distribution, and will now bring forward a few proofs to verify the correctness of those statements. The pipes of the old companies are not only defective from bad workmanship, but also from age; the pipes of the new companies are principally so from the want of proper overlooking when laid, and to these causes combined may be placed the great leakage continually taking place under the surface of the streets. There are *hundreds* of service pipes that are completely *decayed*, and from which *more gas escapes* than *is used* in the houses they supply, and which working its way into the sewers, finds vent at the gratings, and produces the annoying smell so common in the streets of London, whilst no trace of it is discovered (until the ground be opened) where it actually escapes. The joints of the cast-iron pipes are generally defective, and instances have been known of the ends of the pipe and outlets being left open. In addition to these defects, the companies have more pipes in the streets than are actually necessary, and it requires a considerable extra pressure to force the gas through their extended ramification, so as to supply the various levels. In the Strand, near Charing-cross, there are no less than fourteen gas and water-pipes; in St. Martin's-lane, seven; and in most streets they are equally numerous. To supply gas effectually and economically, only two mains of sufficient capacity are required in a street, one of which should be laid on each side, near the curb-stone; at present they are in many cases laid in the centre over the sewer, and are continually being broken by the sinking of the ground, owing to the alterations and repairs of the sewers; they are a complete source of nuisance to the inhabitants near thereto, and many underground apartments and cellars are rendered unsafe to be entered with a light for fear of an explosion. In Bow-street, for instance, a new sewer was made about two years since, and although every care was taken of the pipes during the progress of the work, they have been a continual trouble

* J. W. Parker, West Strand.

and expense to the companies ever since, and the residents still complain of the great annoyance from the smell of gas that prevails; this would not have been the case had the mains been laid in the places previously named. Immediate steps ought to be taken to remedy and prevent the occurrence of the immense waste that is daily taking place, and which will prevent the price of gas from being reduced. I stated this loss to be about 35 per cent., and I have since seen it stated by a gentleman connected with the Chartered Gas Company, as being from 30 to 40 per cent., and I think this ought of itself to be sufficient to induce the companies to take efficient means to remedy the evil, as it renders them incompetent to compete with or withstand the opposition of a new company. They may flatter themselves by placing their losses to other causes, but may rest assured their principal loss arises from leakage underground; it is extraordinary to think how little attention has been paid to this essential part of gas lighting. The main and service-pipes are to the works what the arteries and veins are to the human body, and ought not to have been so long neglected. Trusting that the companies will be wise in time, I am, Sir, &c.,

March 7th, 1846. CARBON.

CURVES FOR ARCHITECTURE.

"Judgment also I will lay to the line."

I was not a little pleased, although much surprised, to see your report of Professor Cockerell's lectures in the same number in which my paper appeared "On the necessity of a more extensive knowledge of true lines," and to observe, that he had alluded to the "hyperbolic line" and "conic sections."

As you state it was his last lecture for the season, we cannot expect any more on geometrical curves from that quarter at present, but let us hope that before another season, he will devote his valuable attention to this as a practical subject.

Also, in your report of the meeting on the 23rd ult., at the Royal Institute of Architects, the word "hyberbolic" likewise appears.

Although so little, on these two occasions, has been said, yet they are sanctions to the very great importance of the inquiry, which gives encouragement.

It would be desirable, and I trust you will be enabled to give to your readers the measurements, a description of the mode of measurement used, and the proof that the curve of the shaft of the columns of the Parthenon is "hyperbolic, and no other;" not, for example, a conchoid, or any other asymptotic line.

Perhaps Mr. Penrose will be so obliging as to furnish you with a description of the probable practical method by which the ancient Greek architects or workmen described the line full size with so much accuracy.

It would be interesting to know what occular and practical knowledge of true geometrical curves Mr. Penrose had before visiting Greece, especially as compared with those who had preceded him there; and whether it was upon such circumstances that he was enabled to determine what is stated, and what no other had before accomplished.

Would it not be equally interesting to know the nature of the curve, and the means the ancient Egyptians used to describe practically the profiles of any of their columns?

"Four centred arches" is, I suppose, a modern term, and the sooner it is blotted out of architectural works the better, as there is no necessity for drawing depressed arches on any such *false* principles; as false as that of patching together four parts of circles, and calling the figures, or substituting it for, an ellipse. Perfect examples, on a perfect plane, on as large a scale as convenient, ought to convince the most sceptical of their imperfect notions. But when will architects make themselves acquainted with true geometrical forms, and the methods by which workmen may describe them in practice accurately?

Architects admit that the Greeks were superior in this knowledge. Why, then, do they not practice or recommend the cultivation of this science, that even the Greeks may be surpassed? Architectural knowledge in the present day appears to consist more of fine terms, than of true forms and real practical information for their true construction.

Supposing Mr. Penrose can satisfactorily prove what he states, does it not shew the very great importance of the mind being familiar with the actual appearance of extreme and intermediate varieties of the hyperbolic lines? What work on "conic sections" can be pointed out that would furnish the eye with a form which would suggest such an application of the hyperbola as to the profile of the shaft of the column of the Parthenon? Before the Greeks could have applied either the hyperbola or any other geometrical lines they must have known them. Other geometrical curves, in like manner, must be known before they can be applied.

There is no more than just importance given to the consideration of this one "hyperbolic line" and to this one application of an hyperbolic line, and in this I agree with Mr. Tite; but equal importance should be attached to hundreds of other geometrical lines, as a knowledge of them would lead to thousands of at present, unknown applications and rules for applications.

It would be impossible to find time at present to pen all the thoughts that have passed through my mind on reading, and since reading, your reports just alluded to, or on my increasing conviction that every exertion should be made by those who have influence and judgment to assist and direct, to have this subject as fully, and in as perfect a manner as possible, brought before the public as the elements of all true design and construction. Nature should be well and constantly studied, and that will furnish numerous suggestions as to application, and produce the greatest scope for variety in designs, but geometry must furnish the true rule, and prove the truth of the law of application.

The mathematical instrument maker, the correct hand and eye of the draughtsman, and the engraver, the printer, &c., &c., must be employed on terms that will enable them to produce a work of the utmost degree of perfection; but all know, that if the numbers who would be benefitted could be made to feel interested in such a work, and would unite, that the individual cost would be trifling compared with the great importance of the subject.

5th March, 1846. JOS. JOPLING.

GRADIENTS FOR LOCOMOTIVES AND ATMOSPHERIC LINES.

SIR,—For the information of your correspondent, on the subject of gradients, I beg to state that the steepest gradients that have been successfully worked upon railways with which I am acquainted, are on the Lichey incline of the Birmingham and Gloucester Railway, which has a rise of 1 in 37, and is worked with an assistant locomotive engine, and one on the Edinburgh and Glasgow, with a rise of 1 in 42.

On the Kingstown and Dalkey Atmospheric Railway, Ireland, the gradient is 1 in 115, but gradients even up to 1 in 20 may be readily surmounted by increasing in due proportion the diameter of the tube, and the power of the machinery; this is not desirable, because it entails a heavy expenditure. Like the locomotive system, the atmospheric is better adapted for planes that approximate nearer to the horizontal, in its maximum effect and economy of working, but it is capable of ascending inclinations that cannot be surmounted with a locomotive engine. Inclines on the locomotive system exceeding 1 in 50, ought to be worked by stationary engine power. The gradients on many of the projected railways in South Wales are of a severe character; in consequence of the mountainous nature of the country; on the South Wales Railway, the steepest gradient is 1 in 52, the Aberdeen Railway 1 in 66, the Brecon and Merthyr Tydfil 1 in 62, the Welch Midland 1 in 37, the Great Eastern and Western 1 in 44, and the Vale of Neath 1 in 30. These inclinations are of no great extent, and it is intended to work them with locomotive power. The steepest gradient on the proposed Hereford and Merthyr Tydfil Railway is 1 in 21, and this line is intended to be worked with atmospheric power. Many of the proposed Welsh lines of railway have been withdrawn or abandoned, some in consequence of not receiving that countenance and support that was anticipated; others from *grievous* errors in the plans and sections; the latter circumstance does not reflect much credit on the *eminent* engineers who *lent* their names to these projects.—I am, Sir, &c., B. B.

Merthyr Tydfil, March 3rd, 1846.

OLD AND MODERN GOTHIC ARCHES.

SIR,—Can you or any of your intelligent correspondents inform me how it is, that one never sees an ancient "pointed" building, whose arches have a keystone, and rarely, if ever, sees a modern one whose arches are without a keystone. It cannot be alleged that this is a pedantic objection, for in practice the two modes operate very differently on the cost of a building. I have seen keystones in modern arches formed at great expense, where in like situations an ancient arch would have a mere joint, and some of these have stood unmoved for 500 years.

Your old subscriber,

London, March 2, 1846. W. Y.

*** The use of a keystone in pointed arches is erroneous, although, as W. Y. justly says, it is to be found in most of the modern Gothic buildings.

Correspondence.

SMALL DRAINS.

SIR,—Your notice about drains, in the last number of THE BUILDER, deserves much attention; any hint from practical men would be exceedingly valuable. In the meantime, I would suggest that the pipes for London service should be *somewhat* laager, and at the extreme end, where they would join the main sewer, if a slight dip is formed, it would become a stench-trap, by the last drop of water remaining in the bend, and effectually prevent any effluvia from returning to the house from the main sewer. A bend of this kind in so small a pipe could not possibly retard the flushing.—I am, Sir, &c.,

March 9, 1846. Z. Z.

Miscellanea.

PARLIAMENTARY REPORT ON ART-UNIONS.—The Committee of the House of Commons, appointed so long back as May, 1844, have at length published their Report. It forms a ponderous tome of 527 pages, and includes the evidence of Messrs. Godwin, Cash, G. M. Mason, Bell, Stewart, Blacker, Fahey, T. Uwins, R.A.; A. Cooper, R.A.; W. Wyon, R.A.; W. Etty, R.A.; Copley Fielding, C. Stanfield, R.A.; Wagstaff, H. Graves, Leggatt, Ryall, John Burnet, John Pye, D. Colnaghi, W. Finden, Turner, V. Palmer, M'Queen, Shenton, Moore, Boys, C. L. Eastlake, R.A.; Mrs. Parkes, Brett, Vokins, and G. Foggo, in the order we have placed them. The Appendix contains the prospectuses of various foreign art-unions. We shall look to the Report anon.

THE MIDDLESEX NEW PRISON.—We stated last week that the designs for the Middlesex House of Detention were furnished by the government inspectors of prisons; and this has been generally reported. The fact is, however, that it is from an original design of the county surveyor, Mr. Moseley, the magistrates having determined to adopt that gentleman's plan for the *entire* rebuilding, rather than that of the "Surveyor General of Prisons," for its partial construction *only;* and the Secretary of State having (subsequently upon the report of the inspectors) sanctioned this more perfect mode of execution. The work is proceeding under the superintendence of Mr. Moseley.

THE THAMES TUNNEL.—At a meeting of the proprietors of this undertaking, held last week, a report from the court of directors was read. From it we learn, with regret, that Sir Isambard Brunel is so seriously indisposed, that he is not likely again to take any active share in the concerns of the company. None of the schemes for carrying a railway through the tunnel are sufficiently matured to warrant a detailed reference to them.

GREEN-HOUSES, &C., UNDER BUILDINGS ACT.—Weeks and Day, of the King's-road, Chelsea, have prepared a petition to Parliament, praying that these and such like buildings be exempted from the control of the Act, and they ask the co-operation of parties interested.

Society of Arts.—At a meeting held March 4, Mr. T. R. Cramptom made a communication on the subject of large and small driving wheels as applied to locomotive engines, in which he stated the following was the reason why the large wheels were after a series of experiments made on the Great Western Railway, first decreased and afterwards increased in size, viz., that the Ajax, which was built with 10 feet wheels and had a total heating surface of only 474 feet, was found not to answer; while the North Star with 7 feet wheels and 724 feet of heating surface or actual power, was found to work with efficiency. In consequence of this, the following two engines were then built: the Fire Fly with 7 feet wheels and 705 feet of actual power; and the Fury, with 6 feet wheels and 608 feet of power; after some months' working the small wheels were given up for want of power, and the larger ones, 7 feet, were generally adopted, thus clearly shewing that the size of the wheels had very little to do with the power, it being a question entirely of heating surface. He was of opinion that the ten feet wheels would have been at work at the present time had they had the 724 feet of surface applied to them in the first instance, as well as to the seven feet wheels.*

Parliamentary Returns relating to the Buildings Act.—In accordance with the suggestion made in our columns a fortnight back, Mr. Hawes has moved for a return "of all sums of money received for salaries, or by fees, or from any other source; either by the registrar, official referees, clerks, district surveyors, or by any other person employed in the execution of the Metropolitan Buildings Act, for what purpose, and for what duty or business the same has been received, and by whom received, since the said Act came into operation. And, also, return of all payments made, and all expenses incurred, from the said period, in the execution of the said Act; also, of all or any sums of money now owing to or by the department of the Metropolis Buildings Office."

Fitzwilliam Museum.—Mr. Cockerell has submitted drawings for the completion of the hall and staircases of the Fitzwilliam Museum, for which parts of the building Mr. Basevi had not left designs in a settled form. The Syndicate have expressed their entire concurrence with Mr. Cockerell's views as to the mode of finishing this part of the Museum; and have recommended that he be requested to prepare working drawings and estimates corresponding with his designs, with a view to a contract being made for the execution of the work. The designs are placed in the Fitzwilliam compartment of the public library, for the inspection of the members of the senate.

Disfigurement of the National Gallery.—The unsightly disfigurement at the east end still remains, and numerous other long pipes have sprouted up in various parts of the buildiug. The continuance of the abominable deformity to which we have already more specially alluded, will impeach the taste and good feeling of every architect academician.

The Works at Wells Cathedral.—In our notice last week of the restorations now going on at Wells, we accidentally omitted to state that they are under the able direction of Mr. Benjamin Ferrey.

MEETINGS OF SCIENTIFIC BODIES.

During the ensuing week.

Monday, March 16.—Statistical, 12, St. James's-square, 8 P.M.

Tuesday, 17.—Civil Engineers, 25, Great George-street, 8 P.M.; Linnean, Soho-square, 8 P.M.; Syro-Egyptian, 71, Mortimer-street, Cavendish-square, 8 P.M.

Wednesday, 18.—Society of Arts, Adelphi, 8 P.M.; London Institution, Finsbury Circus, 7 P.M.; Microscopical, 21, Regent-street, 8 P.M.; British Archæological Association (Westminster Literary Institution), Leicester-square, 8½ P.M.

Thursday, 19.—Royal, Somerset House, 8 P.M.; Antiquaries, Somerset House, 8 P.M.

Friday, 20.—Royal Institution, Albemarle-street, 8½ P.M.

Saturday, 21.—Asiatic, 14, Grafton-street, 2 P.M.

* We refer our readers to an advertisement in our present number, detailing the premiums offered by this society during the present session, for inventions and improvements, in connection with the arts, manufactures, and commerce.

NOTICES OF CONTRACTS.

[We are compelled by the interference of the Stamp Office to omit the names of the parties to whom tenders, &c., are to be addressed. For the convenience of our readers, however, they are entered in a book, and may be seen on application at the office of "The Builder," 2, York-street, Covent-garden.]

For supplying the parish of Greenwich with Cornish Granite Curb, and other paving-stones, &c.

For supplying her Majesty's Dock-yards with Riga fir-timber, Norway spars, &c.

For building a mansion and offices at Exning Hall, Suffolk.

For laying down, repairing, and keeping in repair for three years, the foot and carriage paving of the town of Cambridge.

For the erection of two lodges, with gate entrances, in front of the Industrial Schools, Kirkdale, Liverpool.

For the construction of an iron roof to cover 800 square yards of ground, being part of the coach station at Edge Hill, for the Grand Junction Railway Company.

For building a lock-up and keeper's residence, at Great Neston, Cheshire.

For constructing a bridge across the Etheron, near Birkenhead.

For building a church at Hollings, in Walsden, near Todmorden.

For the whole of the work required in the erection of a boiler-maker's shop, for the Manchester and Leeds Railway Company.

For executing the works of the first division of the Liverpool and Bury Railway, consisting wholly of brick arches and street bridges.

APPROACHING SALES OF WOOD, &c.

BY AUCTION.

At the Bell Inn, Maidstone, 180 oak trees, of large size and superior quality.

At the King's Head Inn, Coventry, a large quantity of valuable oak, ash, and elm timber trees.

At the Black Dog Inn, Stretton on Dunsmore, near Coventry, 53 superior oak timber trees.

At Blake Hall, Ongar, 35 lots of large oak, ash, and elm timber trees.

At the Lion Inn, Rayleigh, 150 large elm and oak timber trees and pollards, now growing.

At Witham, Essex, 200 ash and elm timber trees.

At Lynford, near Brandon, 500 prime larch trees; 500 elm trees; a quantity of ash, lime, walnut, and Spanish chesnut trees, &c.

At the George Inn, Erle Stoke, 600 elm trees, and a few ash.

At the White Horse Inn, Romsey, upwards of 3,000 superior oak timber trees, of extraordinary quality and large metings.

At Little Bentley, Essex, 1,500 capital larch fir trees, and 500 ash ditto.

TO CORRESPONDENTS.

"G. F."—*Thanks. The paper shall appear next week.*

"An Old Subscriber."—*We cannot read the communication.*

"J. Barlow."—*An advertisement would perhaps obtain him employment.*

"A. M."—*We are not disposed at this moment to recommend one patent "dry gas meter" in preference to another.*

"J. A. D." *is thanked for his solution of "cant" problem. We have received the same from other sources.*

"J. H. M."—*Ditto.*

"M. Wright."—*Ditto.*

"W. H."—*The church commenced in Old-street, City-road, is to contain* 1,000 *persons, and will have a tower and spire. Mr. Ferrey is the architect.*

"W. M." (Seven Oaks).—*The letter was accidentally mislaid. We have discontinued publishing current prices in consequence of the diversity which we found.*

"H. G."—*The material of which the gates and palisades in front of Buckingham Palace are made, is a composition called* golden metal. *They were made by Parker of Argyll-street, Regent-street.*

"J. H." *will most likely find the information he seeks at page* 141, 190, 238, *or* 506 *of the last volume of* The Builder.

"P. & L." (Oxford).—*Address Mr. S. Wride, secretary to the Hull General Cemetery Company.*

"W. Snow."—*Marine glue works, Limehouse.*

"Doulton and Watts," and "Chaucer's Tomb," *next week.*

Books.—*We are obliged to decline recommending books.*

Received: "J. A. P.," "A Parishioner" (Ipswich), "G.," "W. E. S.," "E. Pearse," "J. G. S.," "Mr. Newton;" "The Decorations of the Garden Pavilion at Buckingham Palace," engraved under the superintendence of L. Gruner. Murray, 1846.

ADVERTISEMENTS.

TO BUILDERS AND CARPENTERS.

A Considerable saving will be effected in the purchase of IRONMONGERY, by applying at F. R. WILLIAMSON'S Wholesale Warehouse, No. 35, Chiswell-street, Finsbury-square, near Whitbread's Brewery.

Best Patent Cut Clasp.

3d.	4d.	6d.	8d.	10d.	20d.	
6d.	7½d.	8½d.	1s. 1d.	1s. 6d.	2s. 3d.	per 1000.

Best Sheet Floor Brads 16s. 6d. per cwt.
Best Town Glue 44s. per cwt. Do. Scotch 54s. per cwt.
Best Patent Sash Line.

1	2	3	4	5	6
4s. 3d.	5s.	6s. 6d.	7s. 6d.	10s.	12s. per gross.

Elliptic Stoves, 3d. per inch. Registers, 6d., 7d., 8d. per inch.
Self-acting Kitchen Ranges with Oven and Back Boiler.
Wrought Bars and Bright Fittings.

3 ft., 3l. 3s.	3 ft. 6 in., 3l. 12s. 6d.	4 ft., 4l.

Lists of Prices had on application at the Warehouse; if by letter prepaid, inclosing postage stamp.

RAIN WATER PIPES, Heads, Shoes, and Elbows, Half-round and O G Gutters, Sash Weights, Railing Bars, Sink and Stable Traps and Gratings, Air Bricks, Coal Plates, &c.; Gas and Water Pipes from 1¼ in. to 12 in. in diameter, with Bends, Branches, Syphons, and Lamp Columns; also Hot-water Pipes, with all the usual connections. A large Stock of the above Castings at JONES'S Iron Bridge Wharf, and No. 6, Bankside, Southwark.

WM. BANGHAM,
FURNISHING UNDERTAKER,

NO. 7, Stockbridge-terrace, corner of Vauxhall and Pimlico roads, begs to inform the Trade they can be supplied with every article requisite for funerals at the lowest furnishing prices, and a liberal credit if required.

For the convenience of the trade every facility is studied. LEADEN COFFINS may be obtained full trimmed in an hour, and every other article on the shortest notice. Cambric and Satin Shrouds, Winding Sheets, &c. Horses, Coaches, Feathers, Velvets, Heraldry, &c. Country orders punctually attended. No extra charge for delivering large coffins within ten miles.

ATKINSON'S CEMENT.—The public is respectfully informed, that the price of this very excellent Cement, which has now been in use for Architectural and Engineering works upwards of thirty years, is reduced to 2s. 3d. per bushel, and may be had in any quantity at Wyatt, Parker, and Co.'s Wharf, Holland-street, Surrey side of Blackfriars-bridge.

N.B.—This Cement being of a light colour, requires no artificial colouring or painting, and may be used for stucco with three parts its own quantity of sand.

PORTLAND CEMENT, which does not vegetate, and requires no colouring, is perfectly hydraulic, and resists the action of Frost. The cost of the material and of working it is about the same as Atkinson's Cement, Manufactured by J. B. WHITE and SONS, Milbank-street, Westminster, and sold at their Warehouses:—
Druce's Wharf, Chelsea,
Bell's Wharf, Paddington,
Earl-street, Blackfriars,
Albion Wharf, Deptford-bridge,
by Salmon and Co., Dublin,
and at 36, Seel-street, Liverpool.

ROMAN CEMENT, &c.
REMOVAL.
THOMAS JOHN CROGGON
Begs to inform the Trade that he has removed to
8, LAWRENCE POUNTNEY-HILL and
THREE CRANES WHARF, 69, Upper Thames-street.
Orders addressed to either place for ROMAN CEMENT of genuine quality will be executed with promptitude and the strictest regard to quality and economy.

KEENE'S PATENT MARBLE CEMENT.

WITHOUT noticing CAUTIONS, which are as absurd as they are uncalled for, or disproving assertions, which carry with them their own refutation, the patentees of KEENE'S CEMENT venture to believe, that this material will very advantageously stand the test of comparison with any cement of a similar nature, however INVALUABLE, now before the public. They derive this opinion from its all but exclusive use in the new buildings north of Hyde-park, on the Brompton estate, and in many other public and private edifices, both in London and the country. Amongst others may be mentioned the works recently executed at the Colosseum, Regent's-park, where its hardness and beauty of appearance have caused it to be extensively used for skirting and other mouldings, in place of wood, for columns instead of marble, and as a substitute for stone in paving the floors of the corridors and conservatories.

Patentees and manufacturers, J. B. WHITE & SONS, Milbank-street, Westminster,

MARTIN'S FIRE-PROOF AND ORNAMENTAL CEMENT.

CAUTION.—Messrs. STEVENS and SON, Patentees, beg to caution their friends and the trade generally against confounding this invaluable Cement with others, erroneously said to be of the same description. S. and S. pledge themselves, that MARTIN'S CEMENT is totally dissimilar in composition and manufacture from every other, and, being a neutral compound, is not only free from chemical agency upon any substance with which it may come in contact, but completely resists the action of the strongest acids. They feel it a duty to direct attention to the following properties, which it exclusively possesses:—

1. It rapidly acquires the hardness of stone.
2. Unlike other internal cements, its hardness is uniform throughout its entire thickness.
3. Its surface (which may be made equal to that of the finest marble) NEVER THROWS OUT ANY SALT, and will receive paint in four days, without peeling, when put upon dry work.

It is peculiarly adapted as an internal stucco for walls, skirtings, architraves, mouldings, and enrichments of all kinds, to all of which purposes it has been extensively applied by Mr. Thomas Cubitt on the Grosvenor estate, &c.

For the above purposes, it possesses great advantages over wood, being more economical and durable, resisting fire, damp, and vermin.

For the floors of hall and fire-proof warehouses, its lightness, durability, and uniform surface give it an immense advantage over stone, being, at the same time, much more economical. The most satisfactory references can be given. To be had of the Patentees, Plaster of Paris and Cement Manufacturers, 186, DRURY LANE.

Agent for Liverpool and Manchester, Mr. R. PART, 28, Canning-place, Liverpool.

HENDRY and GLOVER, IRON-FOUNDERS, beg to inform their customers that they have removed their Foundry (from Smart's-buildings) to CHARLES-STREET and 109, DRURY-LANE, where they have adopted every improvement to enable them to compete successfully in quality, price, and punctuality. They have also an extensive and well-arranged stock of patterns for every description of Castings.

IRON BRIDGES AND PIERS.

THE Economy and Safety of DREDGE'S PATENT PRINCIPLE are explained in the "Mechanic's Magazine" No. 1172, and practically proved in Fifteen Public Bridges in Great Britain alone, four of which are Country Bridges for Common Road Traffic, varying from 50 to 294 feet in length. The continual destruction of Bridges and Viaducts is owing to an error of principle in their construction which is this. The line of equal horizontal thrust or pressure, both in suspension and compression bridges, should be sustained by the roadway, and not by the arch, as it universally is in the old systems; and hence the cost, the undulation and oscillation, and destruction of bridges are enormous.

Bath, Feb. 1846.

CAEN STONE.

LUARD and BEEDHAM have a quantity of the above stone, of the best quality, direct from their Quarries at Allemange, which may be inspected at the Norway Sufferance Wharf, Greenwich.—Further particulars at Mr. G. GATRS', 18, SOUTHWARK-SQUARE, SOUTHWARK.

PIMLICO MARBLE AND STONE WORKS, BELGRAVE WHARF, PIMLICO-ROAD.

SAMUEL CUNDY begs to inform Architects, &c., that every description of Stone, Marble, and Granite work is executed at the cheapest possible rate.

Estimates given for Mason's Work in all its branches. Gothic Work, Tombs, Monuments, &c.

MARBLE WORK for Halls, Dairies, Tables, Columns, Vases, at most reasonable prices.

A large collection of Designs for Mural and other Monuments.

CHIMNEY PIECES from Twelve Shillings upwards.

Depôt for CAEN STONE, &c.

PREPARED FLOORING BOARDS.

AT REDUCED PRICES.

ALWAYS ON SALE, a LARGE ASSORTMENT of DRY PREPARED FLOORING BOARDS and MATCHED BOARDING of all sorts, planed to a parallel width and thickness, from ¾ inch to 1¼ inch thick. Rough Boarding for Flats.

TIMBER, DEALS, OAK PLANKS, SCANTLINGS, SASH SILLS, &c.

Apply at W. CLEAVE'S Timber Yard, Smith-street, Westminster.

PREPARED FLOORING BOARDS.

ALWAYS ON SALE at A. ROSLING'S, SOUTHWARK-BRIDGE-WHARF, BANKSIDE, and Old-Barge-Wharf, Upper Ground-street, Blackfriars, a very large stock of well-seasoned Floor Boards of every variety.

A. R., in calling the attention of builders and consumers, confidently presumes on his being able to supply them on such advantageous terms, as will ensure and merit their favours and approbation.

THE SOCIETY

FOR THE ENCOURAGEMENT OF

ARTS, MANUFACTURES, AND COMMERCE.

President,

HIS ROYAL HIGHNESS PRINCE ALBERT, D.C.L. F.R.S. &c.

LIST OF SPECIAL PREMIUMS: Session 92nd, 1846.

UNDER the New Rules and Regulations, which have been adopted by the Society during the present Session, for the renovation of the working constitution of the Society and the more efficient promotion of its objects, the Council have recommended, and the Society has adopted, the following list of Premiums, approved by the Special Committees of the different Sections of the Society, and they are now offered for public competition:—

I.

In the SECTIONS of AGRICULTURE and CHEMISTRY.

A PRIZE OF ONE HUNDRED GUINEAS,
For the Invention of a mixture of materials for a wholesome, nutritious, and palatable Bread, to be sold at a low price and used as an economical substitute for wheaten bread, biscuit, or potatoes. The materials suggested are sago, rye, wheat, maize, barley, beans, peas, oats, rice, beet-root, parsnips, &c. To be given in on or before the 13th of April, 1846.

II.

In the SECTION of FINE ARTS.

A PRIZE OF TEN GUINEAS, WITH THE SOCIETY'S MEDAL,
For the Model of an Earthenware Jug, in one colour, to contain a Quart, with a Cover.

A PRIZE OF FIVE GUINEAS, WITH THE SOCIETY'S MEDAL,
For the Model of an Earthenware Mug, in one colour, to contain a Pint, without a Cover.

A PRIZE OF TEN GUINEAS, WITH THE SOCIETY'S MEDAL,
For the Design or Model of the Cover of a Bible, 9½ inches by 12, to be executed in relief, in raised leather or in wood, either by the new process of burning or by the carving machine.

A PRIZE OF FIFTEEN GUINEAS, WITH THE SOCIETY'S MEDAL,
For a Water-Colour Drawing, 24 inches by 12 inches, of a Holy Family, suitable for engraving in wood, and specially prepared for printing in colours by wood blocks;—the object being to produce, at a cheap rate, a good picture, which may find its way into humble dwellings.

A PRIZE OF FIVE GUINEAS, WITH THE SOCIETY'S MEDAL,
For a small Geometrical Pattern for a cheap Kidderminster Carpet and Stamped Drugget.

A PRIZE OF FIVE GUINEAS, WITH THE SOCIETY'S MEDAL,
For the cheapest and most beautiful pattern of Mosaic or Tile Flooring, one yard square.

A PRIZE OF FIVE GUINEAS, WITH THE SOCIETY'S MEDAL,
For a Design of the most convenient, elegant, and cheap Washing-stand, Basin, and Ewer.

A PRIZE OF TEN GUINEAS, WITH THE SOCIETY'S MEDAL,
For the Model of a Tea Urn of a small size.

A PRIZE OF TEN GUINEAS, WITH THE SOCIETY'S MEDAL,
For Models of a plain and cheap Earthenware Tea Service, in one colour, consisting of Tea-pot, Basin, Milk-jug, Cup and Saucer, and Plate.

III.

In the SECTION of MECHANICS and MECHANICAL ARTS.

A PRIZE OF TEN GUINEAS, WITH THE SOCIETY'S MEDAL,
For a simple and good method of applying Steam Power, directly, to propelling Vessels by the Screw.

A PRIZE OF FIVE GUINEAS, WITH THE SOCIETY'S MEDAL,
For an improved Meter, applicable to measuring the quantity or volume of liquids passing through pipes under pressure on both sides.

A PRIZE OF TEN GUINEAS, WITH THE SOCIETY'S MEDAL,
For an improved Landing Pier, for embarking and landing Passengers, &c. by Steam-boats on Tidal Rivers.

A PRIZE OF FIVE GUINEAS, WITH THE SOCIETY'S MEDAL,
For a portable and compact Machine for Raising and Lowering Heavy Articles from Carts while standing on the streets.

A PRIZE OF FIVE GUINEAS, WITH THE SOCIETY'S MEDAL,
For a Horse Shoe, adapted to the several kinds of pavement now in use.

A PRIZE OF FIVE GUINEAS, WITH THE SOCIETY'S MEDAL,
For an Improved Method of Preventing the Emission of Noxious Vapours from the Gratings of Sewers; which shall permit a free passage of the sewerage, and provide against bursting the drains.

A PRIZE OF FIVE GUINEAS, WITH THE SOCIETY'S MEDAL,
For effective Ventilation of Ordinary Rooms, without cold currents or complex apparatus.

A PRIZE OF TEN GUINEAS, WITH THE SOCIETY'S MEDAL,
For a method of providing against injury and accident produced by the Noxious Vapours of Fusees and Explosions in Mining and Tunnelling, by means of improved ventilating apparatus or otherwise.

A PRIZE OF TEN GUINEAS, AND THE SOCIETY'S MEDAL,
For a Mechanical Contrivance for "Coal Whipping," to supersede the necessity of men nearly naked destroying their health and shortening their lives by hoisting coals from vessels on the river.

IV.

In the SECTION of MANUFACTURES.

A PRIZE OF TEN GUINEAS, WITH THE SOCIETY'S MEDAL,
For the best application of Glass to the construction of Water-pipes, Tiles, and Drains.

A PRIZE OF TEN GUINEAS, WITH THE SOCIETY'S MEDAL,
For the invention and application of a Cheaper kind of Glass than any now in use.

A PRIZE OF FIVE GUINEAS, WITH THE SOCIETY'S MEDAL,
For the best Machine for Cutting Wood into given forms.

A PRIZE OF FIVE GUINEAS, WITH THE SOCIETY'S MEDAL,
For the best Imitation of Ivory, in Plaster Composition, for Models and Sculpture.

A PRIZE OF FIVE GUINEAS, WITH THE SOCIETY'S MEDAL,
For the most elegant Design for a Stamped Table-cover in Woollen Materials.

A PRIZE OF TEN GUINEAS, WITH THE SOCIETY'S MEDAL,
For a method of Printing in Distemper by Blocks, so as to "keep register" more perfectly, and produce finer specimens of art in Paper Hangings than by the ordinary methods.

V.

In the SECTION of COLONIES and TRADE.

THE SOCIETY'S GOLD MEDAL,
For the best applications of Machinery, as a substitute for manual labour, in the various processes of Cultivation and Manufacture of Sugar, Cotton, and Coffee in our West India Colonies and the Mauritius.

THE GOLD ISIS MEDAL,
For the invention or importation of any Material, the produce of our Colonies, as a substitute for Hemp or Flax.

The object to be attained by these Prizes is generally sufficiently obvious, the encouragement of ingenuity and talent by publicity and distinction, the direction of invention to the most useful purposes, and the wider diffusion of taste and knowledge in objects of Arts and improved Manufactures is the object generally of the exertions of the Society.

The Prize for the mixture of ingredients for a wholesome and nutritious bread is the suggestion of a benevolent individual, who has contributed largely to the Prize Fund of the Society. It is peculiarly applicable to the present wants of the people, when the coarser kinds of grain and other food are required to be used for the supply of deficiencies in the usual crops; and it is believed that an article much more nutritious than potatoes, and equally palatable, may be obtained by a mixture of wholesome but cheap materials at a price less than half that of ordinary bread.

The Prizes in the Fine Arts are intended to promote the diffusion of a love for the symmetrical and the beautiful, by supplying in cheap materials, of elegant forms, objects suited to the familiar uses of every-day life. It is required, therefore, of competitors, that the forms chosen be distinguished by simplicity in their beauty, and by facility of execution in cheap materials, so as to be sold at low prices for general use. The Designs rewarded to become the property of the Society. The name of the contributor should be enclosed in a sealed envelope, with a motto or device on the outside. The objects of the remaining Prizes require no explanation.

NOTICE.

Candidates are requested to observe, that if the means by which any of the proposed objects are effected should be found to occasion an increase of expenditure or labour unsuited to general purposes, the Society will not consider themselves bound to give the offered reward. They expressly reserve the power, in all cases, of giving such part only of any premium as the performance shall be adjudged to deserve, or of withholding the whole. The candidates, however, are assured that the Society will judge liberally of their claims.

All Communications, Drawings, and Models designed for competition must be delivered to the Secretary of the Society of Arts, at the Society's Rooms, John Street, Adelphi, postage and carriage free, on or before the 15th of May, 1846.

EXTRAORDINARY CONTRIBUTIONS.

The following Extraordinary Contributions have been generously offered to the Council for the promotion of the objects of the Society under the New Rules and Regulations, for furthering the increased usefulness of the Society, for extending the lists of Premiums, for assisting to obtain a Charter, and for the other objects named in the Address of the Council, recently circulated among the Members.

TO THE SPECIAL PRIZE FUND.

A. B.	£150	0 0
C. D.	50	0 0
	£200	0 0

GENERAL DONATIONS.

Thomas Lewes	£25	0 0
John Pepys	10	10 0
	£35	10 0

LOAN FUND OF £1000.

T. Webster	£50	0 0
W. F. Cooke	50	0 0
F. Whishaw	50	0 0
E. Speer	50	0 0
J. S. Russell	50	0 0
G. T. Kemp	50	0 0
Sir I. L. Goldsmid, Bart.	50	0 0
R. Stephenson	50	0 0
A. A. Croll	10	10 0
	£410	0 0

INCREASED SUBSCRIPTIONS.

C. Holtzapffel	£5	5 0
G. Bailey	6	6 0
P. Vaughan	6	6 0
P. L. M. Foster	6	6 0
W. F. Cooke	5	5 0
T. Winkworth	6	6 0
R. Albano	6	6 0
A. Wall	6	6 0
W. Everett	6	6 0
T. Davison	6	6 0
J. Horton	6	6 0
W. N. Campbell	6	6 0
R. H. Solly	6	6 0
J. Reeves	6	6 0
L. H. Petit	6	6 0
J. Wood	6	6 0
A. A. Croll	6	6 0
L. Ames	6	6 0
	£113	8 0
	£758	18 0

The Supplementary List will be published at an early date.